Module 4: Teacher Labor Markets

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Introducción

At its simplest, a market brings together buyers and sellers to exchange goods or services. This process is at the heart of microeconomic theory. Economists employ the model of the market to describe the exchange of goods and services as diverse as shoes, software, and medical care. The discussion in Module 2 makes clear that education is no exception. The model of the market is particularly useful in studying the work and behavior of classroom teachers. Economists of education use markets to explain the demand and supply of teachers, to make predictions about the future teacher workforce, and to examine the behavior of teachers in selecting schools, entering and exiting the profession, and teaching their classes. Without question, the study of teacher labor markets is an important and growing concern in the economics of education.

For a number of reasons, markets for the teacher labor are quite different from other markets. To begin with, in markets for goods such as shoes, the firm is the supplier and the consumer is the demander. In teacher labor markets, however, the firm (school) demands the services of the producer (teacher). Additionally, the school does not demand the actual teacher. Instead, the school's demand is based on the teaching services that the teacher produces. The demand and supply of teachers also adjust much more slowly to changes in the underlying market than do the demand and supply for bread or milk. Finally, various factors often prevent the market for teachers from reaching "equilibrium," meaning that there are often shortages or surpluses of teachers.

Despite these differences, the model of the market is extremely helpful in describing the behavior of teachers and those who demand their services. The study of teacher labor markets can help prospective and current teachers understand how the economy and population affect the status, pay, and working conditions of the teaching profession. With this knowledge, teachers and prospective teachers can more accurately assess the tradeoffs involved in choosing teaching over other fields. For the same reasons, knowledge of teacher labor markets is also important for school administrators and educational policy makers responsible for recruiting, hiring, and retaining high-quality teachers.

The module is organized as follows. In Section 1 we discuss how teacher labor markets are different from other markets we observe in the economy. Of course, teachers are very different from tomatoes or shoes, but teachers are also distinct from workers in other types of labor markets. We will discuss these differences and how they make the study of teachers an important component of educational policy making. Section 2 describes the factors that determine the supply and demand for teachers, including population growth, class size, working conditions, costs of becoming a teacher, and incentives to teach. We will also briefly discuss the issue of teacher quality and the effects of teacher education on both teacher quality and the supply of teachers. Section 3 is dedicated to the discussion of teacher salaries: real versus nominal salaries, how teacher salaries are determined and paid, how they compare to salaries in other fields, the effect of teacher unions, and the issue of merit pay. In this section we also discuss changing opportunities for college-educated women, who have for years made up the bulk of most countries' public school teaching force. We conclude this section with an international comparison of teacher salaries, discussing how the salaries of Spanish teachers compare to those of teachers in other OECD countries. Section 4 discusses issues of teacher mobility and teacher career paths. We address questions such as what types of people go into teaching, how long teachers stay in teaching, and how teachers choose where to teach.

In Sections 2, 3, and 4 of this module we first discuss teacher labor markets in a general sense, drawing mostly on evidence and studies from the United States. We use research from the United States due to the greater availability of data on teacher labor markets in comparison to other countries. However, we conclude each section with a discussion of specific issues and concerns in other OECD countries and Spain specifically. Much of this discussion is based on information found in reports issued by the OECD, including *Education at a Glance: OECD Indicators 2004* and *Atraer, seleccionar, formar y retener profesorado de calidad en España: Informe Temático de la OCDE.*

Competencias a desarrollar

Upon completing this module, you should have developed the following skills:

1. Understand and explain how teacher labor markets are distinct from other types of labor markets.
2. Identify and describe the factors that influence the demand and supply of teachers.
3. Calculate surpluses and shortages of teachers based on simple algebraic examples.
4. Understand international differences in teacher salaries.
5. Describe how monetary and non-monetary incentives affect the behavior of teachers throughout their careers.

Plan de Trabajo

To develop the skills listed above, you should read each section and then undertake the activities listed at the end of each section. The activities, necessary steps, approximate time, and resources you will need are listed below.

Activity	Steps	Estimated Time	Necessary Resources
Section 1 Questions	Read and answer questions at the end of Section 1.	1 hour	1. Section 1 of this module
Section 2 Questions	Read and answer questions at the end of Section 2.		1. Section 2 of this module 2. Instituto Nacional de Estadística, *Anuario Estadístico de España 2004:* *Capítulo 3: Educación* 3. OECD Policy Brief: “The Quality of the Teaching Workforce”
Section 3 Questions	Read and answer questions at the end of Section 3.		1. Section 3 of this module 2. OECD report: *Education at a Glance: Education Indicators 2004.* 3. Report by OECD: Sanz Vallejo, V., Ortiz Gordo, E., & Álvarez Prieto, J. J. (2003). *Atraer, seleccionar, formar y retener profesorado de calidad en España:*

			Informe Temático de la OCDE.
Section 4 Questions	Read and answer questions at the end of Section 4.		1. Section 4 of this module 2. Report by OECD: Sanz Vallejo, V., Ortiz Gordo, E., & Álvarez Prieto, J. J. (2003). *Atraer, seleccionar, formar y retener profesorado de calidad en España: Informe Temático de la OCDE.*

1 Important Issues in the Study of Teacher Labor Markets

Students of education may question whether the mechanical model of the market can be applied to the behavior of teachers. How can tools used to explain the quantity of pencils produced in the economy also be helpful in describing the behavior of complex and intelligent educational professionals? In fact, these tools often fall short of the objective because teachers are quite different from pencils. Moreover, the teaching profession is very distinct from other professions studied by economists. In this section we explain the ways in which teachers do not conform to the traditional model of markets for goods and services. First we examine how labor markets are different from markets for goods such as milk, bread, or shoes. Second, we discuss how teachers are different from other types of workers in terms of how we can apply economic tools to study their behavior. Finally, we discuss how the teaching profession is different from other professions. After discussing these differences, it will become clearer that in a general way, teachers—just like any other economic actors—respond to economic incentives, working conditions, and alternative opportunities when making important decisions. In this respect, the model of the market can be helpful in understanding these responses.

1.1 What is a market: key concepts and terms

As discussed in Module 2, the market establishes the value of goods and services. It does this by bringing together buyers and sellers to negotiate prices and quantities. Through the interactions of these economic agents, producers determine the quantity of the good or service they will produce and consumers determine the amount they will purchase. In general, firms are the producers and individuals are the consumers. The key piece of information upon which producers and consumers base their decisions is the price of the good or service. The price at which supply and demand are equal to each other is called the **market-clearing price**. At this price, the market is said to be in **equilibrium**. Studying the market of just one good or service is known as **partial equilibrium analysis. General equilibrium analysis** refers to the study of the markets of all goods and services in the economy and the effects that each has on the other**.**

1.2 How are labor markets different from other types of markets?

We use the term **labor market** when the service that is bought and sold is human labor. Just like any other market, producers and consumers in the labor market negotiate over the quantity and price of labor produced. But in labor economics, the price of labor is generally measured in hourly wages and the quantity of labor is measured in hours worked. Labor markets are also different from other types of market in that the individual (instead of the firm) is the supplier, while the firm (or school) demands the labor. This is because labor services are generally considered to be part of the market for inputs into production ("input market") rather than the market for outputs.

Because workers themselves cannot be bought or sold, consumers in labor markets actually rent the services of laborers. Additionally, the demand for labor is derived from the goods and services that the labor produces rather than the actual laborer. As an example, schools do not demand ownerships of teachers; instead, schools' demand for teachers is derived from the act of teachers teaching students. For this reason, economists refer to the demand for labor as "derived demand."

One more important distinction between markets for goods and labor services is that the worker generally must produce the service in the same place where it is consumed. In the case of education, this is generally a school. This means that working conditions are an important consideration in how much compensation the worker will demand. To illustrate the difference

between the market for goods and labor services, imagine a baker selling bread. The baker does not care about the conditions where his bread will be consumed because he makes all the bread in his own bakery. In contrast, a teacher cares a great deal about the conditions where she will produce her teaching services. She cares about such things as her personal safety, the general environment, the availability of instructional materials, and the personalities of her students and colleagues. All of these factors play a part in how much compensation she demands to teach at a particular school. While she is likely to demand greater salary compensation at a school with less favorable working conditions, if the conditions are very pleasant, she will probably settle for a lower salary. We will discuss this issue at greater length in Section 2.

1.3 How are teacher labor markets different from other labor markets?

Teacher labor markets are different from other types of labor markets in a number of ways. To begin with, teachers produce what is commonly considered to be a **public good**. A "pure" public good is a good that (1) cannot be denied from the general public (the good is non-excludable) and (2) can be consumed by any number of people without decreasing the benefit to each consumer (the good is non-rival). A common example of a public good is national defense. It would be very difficult to exclude any one person from the protection offered by a nation's defense system. At the same time, my enjoyment of this protection does not detract from your enjoyment—increasing the number of citizens does not decrease the protection available to each.

Technically, education is a private good because it is possible to exclude individuals from schools and the consumption of education is bounded by the size of the class, number of materials available, and other factors. However, education is often seen as a "semi" public good because everyone benefits from the advantages of a well-educated population. In other words, education is an excludable and rival good, but its societal benefits are non-excludable and non-rival. These benefits include occupational mobility, a society's knowledge of common civic values, socialization, political stability, and an informed citizenry.

The public good aspects of education prompt governments to provide free education, usually through the level of secondary education. The provision of free public education means that, unlike traditional firms, the school employing teachers does not attempt to maximize profits. As discussed in Module 3, while schools may differ according to their central objectives, for the most part we can say that schools attempt to maximize some type of student outcome, whether it is attendance, discipline, educational attainment, or learning. At the same time, schools must try to reach these objectives using a fixed set of resources. Like private firms, schools must aim for efficiency in producing the greatest amount of output with a given set of inputs. On the other hand, schools often do not bear the costs of hiring teachers, who are usually paid by a central district. If this is the case, then schools are likely to try to attract or retrain the best possible teachers, regardless of their salaries. In contrast, a firm would be more likely to weigh both quality and cost in recruiting employees.

As the school attempts to attract the best teachers, it faces an obstacle uncommon in private industry: it is very difficult to recognize and quantify teacher quality. We will discuss this issue at greater length in Section 3, but for the time being, put yourself in the position of a school principal attempting to identify the best possible candidate for an open teaching position. If you did not have much time to dedicate to your job search, you could select the candidate with the most years of experience or the highest level of education. With more time and a better sense of what type of teacher you were looking for, you could invite candidates to give "demonstration lessons" to see how well they presented ideas and interact with students. Or you could give a test

to see which candidate had the greatest grasp of the curriculum. But it is unlikely that any of these measures would perfectly identify the best teacher for your students. You would only know whether you had made a good choice after several years of observing the teacher and the progress of his or her students.

As a school principal, you would face another challenge quite different from the situation of a private firm. Once you identified the candidate you wanted to hire, you would not be able to "outbid" other firms to recruit this candidate to your school. This constraint arises from the near-universal use of the "uniform salary schedule" to pay teachers. That is, the teacher's salary within a district is based solely on his or her level of education and experience, not incentives offered by any specific school. As a school principal attempting to recruit potential teachers, your only bargaining tool would be the excellent working conditions at your school, such as the abundant instructional materials, high-achieving students, or pleasant collegial environment. However, if you were the principal at a school with limited instructional materials, shoddy infrastructure, and low-achieving students, you would have very little bargaining power to attract excellent teachers, even if you could identify who these teachers were.

1.4 How is the teaching profession different from others?

Just as teacher labor markets are different from other types of labor markets, the teaching profession is quite distinct from others. To begin with, teachers in most parts of the world are rarely monitored closely, so they enjoy a great deal of autonomy over how they allocate their time and effort in the classroom. Of course, as accountability systems grow throughout the world, this aspect of the teaching profession is changing. But for the most part, teachers are among the least supervised and monitored of all professionals. This lack of supervision has both positive and negative consequences for teachers. On the negative side, new teachers and those struggling with their classes have few opportunities to work collaboratively with supervisors to improve their instructional practice. This can also mean that bad teachers stay in their jobs much longer than they should without any attempt to improve or replace them. On the positive side, autonomy gives teachers the ability to experiment and innovate with their lessons and instructional style.

In addition to a lack of direct supervision, teachers often work alone in their classrooms and complain of isolation and a lack of social and professional relationships with their colleagues. In an influential study of the teaching profession in the United States, sociologist Dan Lortie observes: "although there are schools where a sense of professional community exists, mutual isolation of teachers during most of the day is the rule at many schools" (Lortie, 2002, p. xi). The combination of a lack of supervision by administrators and limited opportunities for collaboration with colleagues can lead to enormous variability in teacher quality from classroom to classroom within the same school.

Teachers also have fewer opportunities to advance in their careers than professionals in other fields. Once a teacher receives tenure, there are few other career benchmarks to attain. As a result, although salary differences can be substantial between new and experienced teachers, there are only minor status differences. The inability to significantly increase professional status may in part explain the high degree of teacher attrition in the first several years of teaching: as new teachers accumulate experience and become tenured, they reach a plateau in status and realize that there are few other career goals to achieve. This realization may induce teachers to search for occupations where there are more opportunities to rise in occupational status over the course of their careers.

As with many other occupations, the status of teachers varies over time and across countries and cultures. Factors that influence how society esteems teachers include cultural values, licensing requirements, salary, and the type of work that teachers do. Although it is impossible to quantify status and to measure its effect on teachers and prospective teachers, it is reasonable to conclude that if teachers suffer from low professional and social status, their students are less likely to perceive teaching as a possible career choice. In this respect, teaching is also different from other professions: by virtue of the fact that they interact with young people all day long, teachers are more visible recruiters for their profession than most other professionals. The degree to which they "sell" their profession is likely to have a strong effect on the pool of teachers in the near future.

Although much of this discussion focuses on the negative aspects of the teaching profession, teaching of course offers many advantages. Working with and teaching young people can be personally and professionally rewarding. Additionally, job security is greater in teaching than in many other professions; those teachers who have earned tenure often have their choice as to where and how long they teach. Another frequently cited advantage of the teaching career is longer vacation time. For example, teachers in the United States work an average of 181 days a year, much less than other college-educated workers. In Spain, primary teachers teach an average of 176 days a year, while upper secondary teachers teach 166 days per year (OECD, 2004, *Education at a Glance 2004*). These figures compare to 224 days for the average college-educated Spanish worker. The longer average vacation time enjoyed by teachers makes it difficult to compare teacher salaries to salaries in other occupations. While teachers tend to earn smaller yearly salaries than workers in comparable professions, they often earn a higher hourly or daily wage. Nonetheless, the overall compensation of teachers in OECD countries is lower on average than other professions available to prospective teachers. We will discuss international differences in teacher salaries at greater length in Section 3.

1.5 Why is it important to study teacher labor markets?

A growing body of research suggests that teachers are the most important school-related inputs in producing student achievement. High-quality teachers are important for both educational excellence and equity in access to educational opportunities. Studying teacher labor markets gives us tools to understand how teachers make decisions about whether to go into teaching, where to teach, and how long to stay in teaching. Studying teacher labor markets also sheds light on problems in the way most countries compensate teachers and suggests how incentive systems might be redesigned to attract, retain, and encourage excellent teaching. Finally, for those considering a career in teaching, the study of teacher labor markets can also help to understand how economic forces influence the conditions, compensation, and trends in their prospective careers. While many people consider teaching to be a "calling" that exists beyond the realms of markets and economic incentives, most current and prospective teachers recognize that a passion for teaching is not enough to feed a family or live a comfortable life. The primary lesson of this module is that economic incentives matter, even for teachers.

1.6 Activities for Section 1

1. Consider the market for a good like shoes. List the ways in which the market for shoes is different from the market for teachers. Then list the similarities you see between the two markets. In your opinion, can the same tool (markets) be used to study both the production of shoes and the teaching of young people? Why or why not? [Answer: students should demonstrate an understanding of (1) what a market is; (2) the uniqueness of teacher labor

markets discussed in Sections 1.2 and 1.3; and (3) the general value of applying the market model to teachers. The last point is covered in greater depth in Section 2, so if students miss this point, their understanding should increase.]

2. If you were a school principal looking to recruit teachers for your school, what characteristics would you look for in the candidates for the position? What steps would you require candidates to take in order to demonstrate their teaching potential, e.g. interviews, tests, demonstration lessons? [Answer: Answers will vary, but should demonstrate that there are many conceptions of teacher quality and that identifying quality in teachers is a complex and difficult process.]
3. Consider the possible occupation(s) you have considered. How do you think teaching is different from the other occupation(s)? Do you think it pays less or more? Is the status greater or less? What other factors might influence your decision of which occupation to choose? [Answer: Answers will vary, but should demonstrate knowledge about different aspects of teaching and how these aspects compare to other fields.]

2 The Supply and Demand of Teachers

The concepts of supply and demand constitute one of the most fundamental models in economics. With only two axes and a set of curves, the supply and demand model can represent economic transactions in just about any type of market. The transactions described in this module are based on what economists refer to as **partial equilibrium** analysis. That is, we only discuss the supply and demand of one service: teaching—without considering the interaction of this service with other goods and services (except when we discuss substitutes and complements). Since we study the market for only one service, we must make an important assumption: "all else is equal." Economists use the term *ceteris paribus* to express this assumption. In other words, if we discuss the effect of teacher salaries on the supply of teachers, the "all else equal" assumption means that no other factors that could potentially affect teacher supply are changing. For example, working conditions can obviously affect the supply of teachers, but for the purposes of our discussion on salaries, we must assume that working conditions are *not* changing while teacher salaries *are* changing. That way we can discuss the effect of the change in *one thing,* salaries, on the supply of teachers. We applied this same approach when interpreting specific results from education production functions in Module 3.

In Module 2 we introduced the model of supply and demand and demonstrated how these phenomena can be represented by simple graphs. We now apply these ideas to the labor market for teachers.

2.1 The demand for teachers

In general, four factors influence the demand of a good or service: (1) its price, (2) the prices of substitutes and complements; (3) the incomes of individual consumers; and (4) consumer tastes. Let's look at each of these separately and see how they relate to the demand for teachers.

<u>Teacher Salaries:</u> The price of teachers is the salary that they earn in the educational market. The "consumers" paying these salaries are schools or school districts. Just like any other consumer, schools are less willing to purchase a good as its price increases. As a result, the demand curve for teachers slopes downward. That is, the demand for teachers is *inversely* related to their salaries. As teacher salaries increase, the ability of schools and school districts to hire teachers decreases. This means that if teachers become more expensive, schools may substitute teachers with other educational inputs, such as computers, books, or teaching assistants. The downward-sloping demand curve also means that policies that increase the cost of hiring teachers—such as licensing requirements, entrance examinations, and extensive training—should also reduce the demand for teachers, resulting in a reduction in overall employment in teaching.

<u>Prices of Other Goods and Services:</u> While it may seem difficult to imagine that schools can find reasonable substitutes for classroom teachers, if teacher salaries increased dramatically, schools might substitute teachers with computers, lower paid teaching assistants, or distance education programs. The prices of these substitutes also affect the demand for teachers. Specifically, the demand for teachers is *positively* related to the prices of substitute goods and services. As the prices of substitutes increases, demand for teachers also increases, and vice versa. For example, if prices of computers and instructional software increased dramatically, schools might choose to hire more teachers instead of purchasing instructional technology, thereby increasing demand for teachers. On the other hand, if the price of substitutes for teacher services decreased, the demand for teachers should also decrease because schools would be more likely to substitute teachers with computers.

Other goods and services act as complements to teaching services. These include classrooms or teacher benefits such as health insurance and retirement pensions. The demand for teachers is *negatively* related to the prices of these complementary goods. For example, if the price of providing health care to teachers increased, schools would have to decrease their consumption of teachers to maintain the same level of expenditures on teaching personnel. On the other hand, if the cost of such benefits decreased, schools could afford to hire more teachers without increasing expenditures, so their demand for teachers would increase.

Income: Logic would lead us to believe that as incomes increase, the demand for teachers should also increase. As a society becomes wealthier, it is likely to increase access to education by building more schools and classrooms, reduce class sizes, and attempt to recruit better teachers for its schools. All of these things increase the overall demand for teachers. As a result, incomes should be *positively* related to the demand for teachers.

Tastes: Society's tastes for teaching services have a very large impact on the demand for teachers. Society's tastes might apply to the quality, nature, and number of teachers that schools employ. For example, if a society places a high priority on public education for all children, it is likely to have a larger demand for skilled teachers than a society in which children's education is considered the responsibility of the individual family. Also, if a society determines that it must have small class sizes so that every child will receive individualized instruction, this change in tastes will increase the demand for teachers. Imagine, for example, a country with 100,000 school-aged children. If society demands that class sizes be no larger than 20 students, there will be a total demand of 5,000 teachers. However, if class size is not an important consideration and parents are willing to send their children to classes of 40 students, the demand for teachers will be only half, or 2,500 teachers. Clearly, preference for smaller classes has a large effect on the number of teachers a society demands.

A society can also prefer one type of teacher to another. Although most of the discussion in this module treats teachers as homogeneous, in reality there are many different types of teachers with different skills and types of knowledge. This is particularly true at the secondary level, where history teachers must know very different things from physics or chemistry teachers. Changes in society's preferences for certain types of teachers can affect the demand for one type of teacher at the expense of the other. For example, if a society begins to emphasize mathematics and science curriculum, the demand for math and science teachers will increase. If overall spending on educational personnel does not increase, then the demand for history teachers is likely to decrease as a result of this change in preferences.

Other Determinants of the Demand for Teachers: The four factors discussed above are general determinants of the demand for a generic good or service, but other factors contribute to a society's demand for teachers. The most important of these factors is the size of the school-aged population. In general, as the population of school-aged children grows, so does the demand for teachers, and vice versa. Yet it is important to note that adjustments in teacher demand occur slowly. For example, between the 1994-1995 and 2004-2005 school years, the number of students in non-university public schools in Spain decreased by 13 percent. During the same period, the number of teachers in non-university public schools increased by 18.7 percent. These

changes resulted in a reduction in the student-teacher ratio in pre-school (*infantil*), primary, and secondary education in Spain during this period (MEC, 2004a).

The student-teacher ratio is also an important determinant of the demand for teachers. As class sizes decrease, the demand for teachers increases. While many teachers and parents like the idea of smaller classes, reducing class size requires resources that could otherwise be dedicated to increasing teacher salaries or upgrading classrooms. Therefore, it is important to realize that, in determining the teacher-student ratio, one must weigh class size against other important competing demands for resources.

Another determinant of the demand for teachers is the number of students and hours that teachers must teach. Schools where teaching loads are very large have less demand for teachers than schools with fewer requirements for teachers, all else equal. This does not mean that these schools are better or more efficient, however. Schools with large teaching loads may actually provide lower quality education because teachers are able to devote less time to each student. Again, schools and districts must weigh the tradeoffs involved in deciding how much work to assign to their teachers.

2.2 The supply of teachers

In general, three principal factors influence the supply of a good or service: (1) the price that producers can receive for the good or service; (2) the costs of inputs required to produce the good or service; (3) the technology involved in producing the good or service. In this section we will examine each of these issues separately to see how each relates to the supply of teachers.

<u>Teacher Salaries:</u> Like other workers, teachers consider salary when deciding whether, where, and how long to teach. In general, as teacher salaries increase, more people want to become teachers. Because the supply of teachers is *positively* related to salaries, the supply curve for teachers slopes upward. But it is important to remember that we are making the assumption that “all else is equal.” This includes salaries in other fields available to prospective teachers. If salaries in all other fields remain the same but salaries in teaching increase, then the supply of teachers is likely to increase. However, if salaries in all other fields increase at the same time and by the same proportion as salaries in teaching, then increases in teacher salaries may have little effect on the supply of teachers. This is because teachers face the same tradeoffs in salaries that they did before salaries increased. For this reason, when discussing how teachers react to salaries, we must consider **relative salaries** rather than absolute salaries. A relative salary is the salary that a teacher earns in comparison to salaries in similar fields. To make relative salaries truly comparable, we must compare the salaries of workers of the same age and level of experience in different professions requiring similar qualifications.

To clarify the idea of relative salaries, imagine that you have recently graduated from college and you are considering a career in either teaching or journalism. You will consider many factors in this decision, such as working conditions, status, and your own personal preferences. Of course, you will also consider the salary offered in each field. As you compare these salaries, you will probably calculate the relationship of one salary to the other. For example, perhaps beginning journalists make 90 percent of the salary earned by beginning teachers. This percentage will probably be more important to you than the absolute salary of either teachers or journalists,

because it tells you not only what you will be earning in one occupation, but also what you *would have earned if you had chosen the other occupation*. This is what we mean by relative salaries.

Evidence suggests that relative salaries influence teachers' decisions at various points in their careers. For example, according to a recent OECD report, the relative pay of teachers can influence (1) whether someone decides to become a teacher, (2) a teacher's decision to remain in teaching, and (3) a teacher's decision to return to teaching after an interruption in his or her career (OECD, 2004, "The Quality of the Teaching Workforce"). This means that policy makers must make teacher wages attractive not only for new teachers, but for teachers throughout their careers.

Although relative salaries are extremely important in determining the supply of teachers, they are only relevant if potential teachers have access to many different occupations. On the other hand, if occupational barriers restrict the choices available to certain groups of workers, relative salaries will be less important in their decisions because salaries in other fields are not available to them. In other words, if a group of people is limited to only one type of work, their only decision is whether to work or not; they cannot choose between different occupations. Historically, this has occurred in countries where women and minority groups had access only to a narrow range of occupational opportunities.

In the United States for example, college-educated women and minorities traditionally were limited to jobs in teaching and nursing. They did not have the luxury of comparing salaries and choosing among many different fields. How did these barriers affect teacher salaries? For the most part, the barriers kept salaries artificially low. Because college-educated women and minorities who wanted to work could only choose from a few fields, employers in those fields were able to employ them at salaries much lower than if they had been forced to compete with other employers for their workers. However, once civil rights legislation and changing social norms began to make other careers available to college-educated women and minorities, many of them began to choose other fields. As a result, schools could no longer attract high-quality teachers with low wages.

Murnane, et al. (1991) illustrate the case of African-American college graduates in the United States. In the late 1960s, 70 percent of African-American women who graduated from college and took full-time jobs became teachers. By 1980, this percentage decreased to 25 percent. As other opportunities opened up to these women, they began to compare relative salaries in other fields. Not surprisingly, many of them chose other jobs. One result of this dramatic change was that schools had to raise salaries to retain and recruit new teachers, many of whom were not as qualified as the teachers of earlier generations. We will discuss this issue further in Section 3 when we explain the efficiency wage hypothesis.

<u>The Importance of Women in the Teacher Workforce</u>
It is impossible to discuss the supply teachers without recognizing the fact that in most countries of the world, women constitute the large majority of the teacher workforce, particularly in primary schools. According to a 2004 report issued by the OECD, women made up, on average, more than two-thirds of university-level graduates in humanities, arts, education, health and

welfare, areas of study that commonly lead to teaching careers (OECD, *Education at a glance 2004)*. Spain is no exception: in 2002, women made up 78 percent of all pre-school and primary teachers, 52.3 percent of secondary teachers, and 78.5 percent of special education teachers (MEC, *Las cifras de la Educación en España*, 2004). As we saw in the example in the previous sections, the decisions and opportunities of college-educated women have a profound effect on the nature of the teacher workforce.

In her study of the changing nature of the Spanish family, Inés Alberdi notes that between 1960 and 1997, the labor force participation rate (*tasa de actividad)* of Spanish women increased from 13.5 percent to 37 percent. In other words, the percentage of women who were active in the labor force nearly tripled (Alberdi, 1999). Although many of these new women workers do not go into teaching, the increasing participation of women in the labor force could help to counteract the effects of well-educated women leaving teaching as opportunities open up in other fields. Nonetheless, if policy makers hope to attract and retain high-quality women teachers, they must recognize the conflict that women face when deciding whether to continue working after they have children. A policy brief issued by the OECD notes that while men tend to leave teaching for alternative careers, women are more likely to leave for family reasons. One possible solution offered by the report is for schools to provide supportive services such as childcare to attract these women back into teaching (OECD, The Quality of the Teaching Workforce, 2004).

<u>Costs of Required Inputs:</u> While training to become teachers, young people face both direct and indirect costs. Direct costs include tuition, books, and transportation to classes. As these costs increase, earning a teaching license becomes more expensive. Higher expenses negatively affect the number of young people who decide to become teachers. Consequently, the cost of becoming a teacher is *negatively* related to the supply of teachers. As with salaries, it is important to consider not only absolute costs faced by prospective teachers, but also *relative costs.* That is, how do the costs of becoming a teacher compare to the costs of becoming a journalist, nurse, lawyer, or engineer? If relative costs of becoming a teacher increase, then all else equal, fewer young people will become teachers.

It is also important to consider the indirect costs that prospective teachers incur as they receive training to become teachers. Most importantly, prospective teachers face what economists refer to as **opportunity costs.** A simple definition of opportunity cost is the earnings one forgoes due to a decision *not* to engage in some economic activity. For example, if I quit my job working at a bookstore to earn a teaching license, then the opportunity cost that I incur is the salary that I have lost by not working at the bookstore. Of course, I will probably earn more as a teacher than I would have earned working in the bookstore, but to accurately calculate the benefits and costs associated with each decision, I must consider my lost income at the bookstore as a cost. Opportunity costs are important considerations in the decisions of young people to become teachers. As opportunity costs increase, the supply of teachers should decrease. As a result, training programs that require teachers to be out of the workforce for long periods of time are likely to reduce the supply of teachers more than "alternative certification" programs that allow teachers to work while they earn their teaching licenses.

Countries vary in terms of the requirements that they impose on teachers in order to obtain a license to teach. These requirements could include several years of formal education, specific

training or pre-service programs, or passing a test of pedagogical or subject matter knowledge. In one way or another, all of these requirements increase the costs of becoming a teacher. Consequently, they reduce the supply of young people willing to become teachers. That is, they shift the teacher supply curve to the left. For example, the requirement that teachers receive a minimum score on teacher licensing test eliminates from the potential supply of teachers those who are unable to pass the test, as well as those who are afraid to take the test for fear of not passing. This diminishes the overall pool of prospective teachers, thereby reducing the supply of teachers.

Proponents of strict licensing requirements for teachers argue that such requirements help to prepare a well-skilled teaching force and ensure that licensed teachers meet a minimum level of competency. Other researchers argue that these teacher preparation programs do not significantly increase teacher quality and eliminate many excellent teaching candidates who are not willing to pay high direct and indirect costs to become teachers. We will discuss the issue of teacher training at greater length in our discussion of teacher quality below.

Technology: In a traditional firm that produces goods such as shoes or pencils, advances in technology tend to increase the overall supply of the good. Because they allow the firm to produce more of the good at a given price, technological advances shift the supply curve to the right. This is also true in teaching. For example, if software engineers develop a computer program that can teach multiplication to third grade students, the overall supply of teaching services will increase. But this technology will not necessarily increase the supply of teachers. In fact, technological advances in education—if they act as substitutes for classroom teachers—may actually reduce the *demand* for teachers, which could, in the long run, reduce teachers' salaries.

Other Determinants of the Supply of Teachers: Because teachers are human beings with different preferences, the issues discussed above—salaries, costs of becoming a teacher, and technology—only go so far in determining the supply of teachers in a nation's schools. Other factors inevitably play a part. Two extremely important considerations are the current age of the teaching workforce and working conditions in classrooms and schools.

Age: If a large proportion of current teachers are nearing retirement age, then we can easily see that teacher shortages are likely to occur in the near future. On the other hand, if most teachers are young and inexperienced, this does not necessarily mean that we do not need to worry about teacher shortages. In fact, a teacher workforce composed entirely of inexperienced teachers would be likely to experience shortages every year as new teachers left the profession for other jobs. In fact, research in the United States has found that both the newest and the most experienced teachers are more likely to leave teaching than teachers with intermediate levels of experience. In the first case, new teachers often leave the profession after discovering that it is not for them, or receiving more desirable offers in other occupations. In the second case, every year many experienced teachers retire. We will explore these issues at greater length in our discussion of teacher attrition in Section 4.

Working conditions: the conditions present in a teachers' classroom or school can have a large effect on whether and where that teacher will decide to teach. The next section is devoted to exploring this issue in greater detail.

2.3 Working conditions and the theory of compensating wage differentials.

Although salary is an important consideration in a person's choice of a career, he or she will also try to find a job that conforms to his or her personal preferences for non-salary factors. When deciding where to work, people attempt to match their personal preferences with the daily conditions they will face in a certain job. Of course, personal preferences vary greatly from individual to individual. But most of us value things like personal safety, availability of the resources we need to do our jobs, respect, and status. Teachers are no different. Conditions important to teachers could include the climate of the school where they teach, the relationships they have with their supervisors and colleagues, the availability of instructional resources, the size of their classes, and the "teachability" of their students.

Not surprisingly, working conditions vary considerably from school to school. Some schools are located in peaceful and pleasant neighborhoods and have high-achieving students. Other schools are located in polluted and dangerous areas where resources are scarce and students have low levels of academic preparation. Naturally, most teachers prefer to work at places with more desirable conditions. In fact, teachers may even be willing to forfeit some salary in order to work in a school with more pleasant working conditions. On the other hand, schools with less desirable working conditions may need to offer a higher wage to attract high-quality teachers. The salary difference that workers demand to work at less desirable locations is known as a **compensating wage differential** (Loeb & Page, 2000)**.**

As discussed in Module 1, the idea of the compensating wage differential dates back to the 18th century economist Adam Smith. Economists of education have more recently applied the idea to study how teachers respond to non-pecuniary factors. One of the important implications of the compensating wage differentials is that if employers at schools with less desirable working conditions are not willing or able to pay this differential, then they may be able to maintain the same *quantity* of teachers as schools with more desirable working conditions, but they will have to settle for lower overall *quality*. Moreover, they will probably have to hire teachers who could not get jobs at schools with more favorable working conditions.

As an example, consider two schools in the same city, Good School and Bad School. Both schools pay the same salary, but in other respects, the two schools are very different. At Good School, classrooms are clean and orderly, there are no shortages of classroom equipment or textbooks, and students are respectful and hard working. Bad School provides a stark contrast: classrooms are dirty and in bad repair, there are not enough textbooks for all the students, and students are often unmotivated and disrespectful. If both schools offered the same salary, most teachers would probably prefer to work in Good School. In fact, according to the theory of compensating wage differentials, the two schools actually have two different supply curves. In Figure 4.1 the teacher supply curve for Good School is labeled S^{GS} and the teacher supply curve for Bad School is labeled S^{BS}. S^{GS} is located to the right of S^{BS} because at any given salary, more teachers would prefer to work at Good School than Bad School. In other words, Good School can hire more high-quality teachers for the same salary than Bad School. In fact, if Bad School does not offer higher salaries than Good School, it is likely to have teachers of lower quality.

Salary

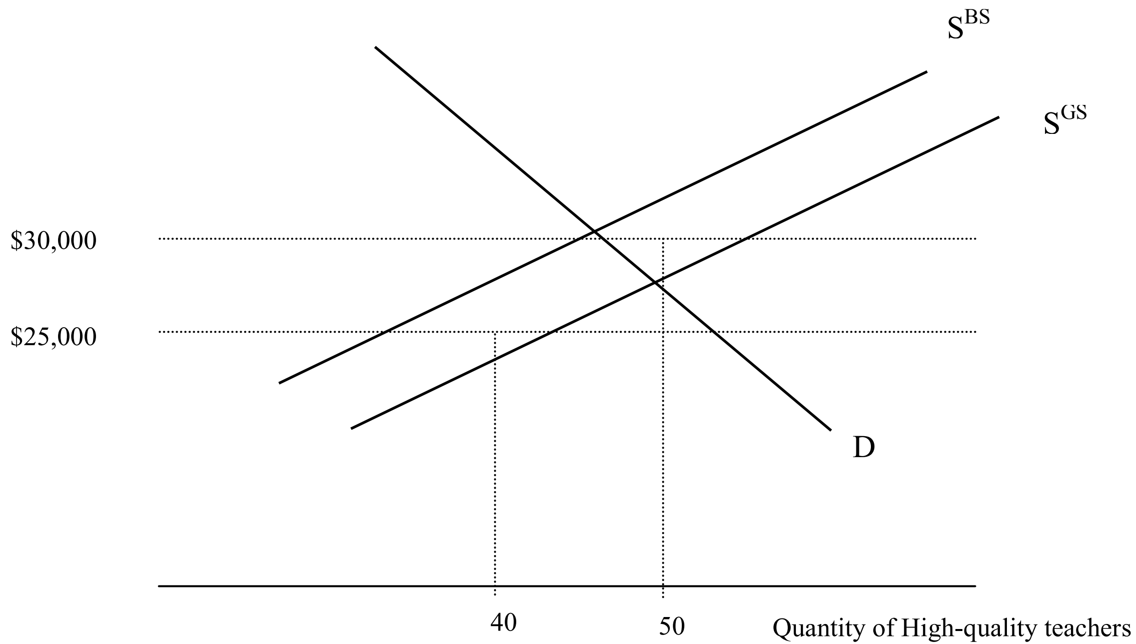

Figure 4.1 Teacher Supply in Two Different Schools

We must make several assumptions for this example to be valid. First, notice that the horizontal axis measures the supply of *high-quality* teachers. We assume that schools can recognize teacher quality, which is not always the case. Second, we also assume that the quantity of teachers is unlimited, but the quantity of high-quality teachers is not. There are a fixed number of high-quality teachers available and willing to teach in Good School and Bad School. Finally, notice that there is only one demand curve for teachers. This is because we assume that Good School and Bad School have the same demand for high-quality teachers. The only difference between the two schools is the working conditions discussed above.

Look closely at the two different supply curves in Figure 4.1. Notice that at any salary, more high-quality teachers are willing to work at Good School than at Bad School. For example, at a salary of $25,000, 50 high-quality teachers would work at Good School, but only 40 high-quality teachers would work at Bad School. If Bad School wanted to hire 50 high-quality teachers, it would have to pay a salary of 30,000 for each teacher. The difference between the individual teacher salary that Bad School must pay and the salary that Good School must pay to hire the same number of high-quality teachers is the compensating wage differential. In this case, it is $5,000.

In most school districts, teacher salaries depend only on years of experience and level of preparation received by the teacher, not the type of school where the teacher works. Because they usually do not have the resources to pay compensating wage differentials, schools with undesirable working conditions are less likely to be able to hire high-quality teachers. Consequently, schools with difficult working conditions are likely to have the lowest quality teachers.

In addition to working conditions within schools, teachers are also likely to consider geographical location and types of schools when deciding where to teach. For example, schools in rural areas have great difficulty recruiting teachers because most teachers prefer to live and work in urban areas. Consequently, a country can simultaneously have teacher surpluses in cities but shortages in rural areas. Also, teachers may be willing to receive a lower salary to work in private schools where students may have better academic preparation and be more disciplined. For example, in Spain, primary teachers in public schools earn on average more than primary teachers in private schools. However, in secondary schools opposite occurs: in 2002, secondary teachers in private schools earned on average five percent more than secondary teachers in public schools (Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto, 2003).

There are several important considerations to consider in discussing the theory of compensating wage differentials. To begin with, the compensating wage differential plays an important role in most societies because it offers an incentive for workers to take unpleasant or dangerous jobs that would otherwise be difficult to fill. Yet the theory rests on several assumptions other than those discussed above: first, workers care about more than salaries when choosing their jobs. Second, workers have information about the working conditions of their jobs. Third, workers can freely change from one job to another without major obstacles (Ehrenberg & Smith, 2000).

It is important to note that the idea of compensating wage differentials is an economic theory that, as of yet, has not had a lot of empirical evidence to support it. In the case of teacher labor markets, it is difficult to prove that teachers respond to non-pecuniary factors when deciding where to teach because the things teachers care about—such as availability of resources, administrative support, and relationships with students—are difficult to measure. However, a growing field of research on teacher "sorting" (discussed in Section 4) has demonstrated that schools with better working conditions, e.g. more advantaged and higher-achieving students, have higher quality teachers. In contrast, less qualified teachers tend to be concentrated in schools with lower achieving, disadvantaged students.

2.4 Equilibrium, shortages, and surpluses of teachers

To review, when the demand for teachers is exactly equal to the supply of teachers, the market for teachers is in equilibrium. At equilibrium, every school fills all of its classrooms and every teacher who wants a job has one. At this point, there is no market pressure to either increase or decrease salaries because everyone is consuming or producing an amount that fits their individual preferences. Graphically, equilibrium is the point where the teacher supply curve intersects with the teacher demand curve. The salary at this point is the equilibrium or market-clearing salary, and the quantity of teachers is the equilibrium quantity.

Like any other market, teacher labor markets can fall out of equilibrium. As discussed earlier, if the demand for teachers exceeds the supply of teachers, there will be a teacher shortage. Conversely, if supply exceeds demand, there will be a surplus of teachers. Let's examine each scenario to see how teacher labor markets might fall out of equilibrium and how they might ultimately adjust and return to equilibrium.

<u>Teacher Shortage:</u> Several different events could lead to the development of a teacher shortage. For example, the student population could experience rapid growth, there could be a large influx of immigrant children to a certain area, or lawmakers could decide to reduce the size of public school classes. All of these events would cause the demand for teachers to shift to the

right. If teacher salaries did not change, the increase in demand would result in a teacher shortage. Alternatively, a drop in teacher supply could also result in a shortage. Such a drop could result from a large number of teachers retiring or leaving the profession for other jobs. Again, if teachers' salaries did not change, the result would be a teacher shortage.

Over time, the teacher shortage would force schools to compete with each other for the limited number of teachers available. If one school increased the salaries it offered to teachers, other schools would have to do the same to attract teachers. Graphically, there would be an upward movement along the demand curve for teachers. As salaries in teaching increase, more young people are likely to choose teaching as a career. Additionally, licensed teachers in other jobs or not working may also return to teaching. As more teachers enter the market, there would be an upward movement in the supply curve for teachers. Ultimately, supply would increase to the point where it met demand, resulting in new equilibrium at a higher salary.

In the market for a good such as bread, supply could quickly adjust to a shortage because the baker would simply need to buy more inputs—such as flour and eggs—and hire more workers to produce the additional bread. But in the market for teachers, a teacher shortage could remain for years. Why? Because it would take time for schools to recruit teachers, for prospective teachers to be trained, or for teachers to move to fill open positions at schools in other locations. Additionally, legislation to increase resources for teacher salaries could meet resistance from lawmakers, particularly in difficult economic times.

Teacher Surplus: What might cause a teacher surplus? Most significantly, a sharp reduction in the number of school-aged children would reduce the demand for teachers. If salaries did not fall to adjust to this reduced demand, the supply of teachers would be greater than demand, resulting in a teacher surplus. Alternatively, if public school teaching suddenly became a popular career choice, the supply of teachers would increase, which could also result in a surplus of teachers. Over time, schools would react to the teacher surplus by lowering salaries. If prospective teachers desperate for work accepted lower wages in order to get a job, salaries would fall until demand and supply reached a new equilibrium at a lower salary. As in the case of a teacher shortage, readjustment to equilibrium could take years. For one thing, there could be laws in place to prevent schools from firing teachers or reducing salaries. Teacher unions could also resist attempts to lower wages by threatening to strike.

In the long run, the market could regain equilibrium even if teacher salaries did not fall and teachers did not lose their jobs. This would occur if teacher salaries did not keep pace with inflation. If nominal teacher salaries (the actual amount you receive) remained the same, but real wages (the value of the salary after accounting for inflation) fell, the buying power of teachers' salaries would decrease over time. If salaries in other fields kept up with or outpaced inflation, then over time, prospective teachers would be more likely to choose these other fields, resulting in a gradual reduction of the supply of teachers. The concepts of nominal and real wages will be discussed in greater detail in Section 3.

2.5 Teacher quality

The above discussion of the demand and supply of teachers implicitly assumes that all teachers are of similar quality. In reality, the quality of teachers varies tremendously from school to school and classroom to classroom. In fact, recent research in the United States suggests that teacher quality varies more within schools than between schools. In other words, there are

greater quality differences among teachers in the same school than between teachers in different schools. It is also clear from research that differences in teacher quality have strong effects on students' academic success. Many studies have found that enhancing the quality of teachers is the single most important thing that schools can do to improve student outcomes.

For a number of reasons, schools and districts have had difficulties recruiting, hiring, and retaining sufficient numbers of high-quality teachers. First, it is not easy to identify high-quality teachers because teaching involves social and psychological interactions that cannot be measured easily. To help identify high-quality teachers, schools often use "proxies" of teacher quality such as level of education or years of experience. However, researchers disagree on whether students of more educated and experienced teachers actually outperform other students. For example, while there is evidence that the first two or three years of experience increase teachers' effectiveness, it is less clear whether teachers with twenty years of experience are more effective than teachers with five years of experience.

On the other hand, teachers' knowledge of the subject and overall intelligence appear to have positive effects on students' academic success. Yet it is costly to administer tests to teachers, and teachers with high scores are not necessarily skilled at interacting or communicating with children. To accurately assess the ability of teachers to successfully communicate concepts and skills to students, schools would need to observe prospective teachers giving different lessons in classrooms with students of various learning needs and abilities. Of course, such an assessment would be very time-consuming and expensive and as a result, rarely occurs in practice.

Another reason that schools have difficulty hiring and retaining high-quality teachers is that young people with good training and excellent knowledge of their subject are also more likely to have greater opportunities in other fields. Studies have shown that prospective teachers with higher test scores are less likely to go into teaching and are more likely to leave the profession than teachers with lower test scores.

Partially due to the difficulty of identifying high-quality teachers, policy makers often respond to teacher shortages by opening up the pool of applicants to less qualified prospective teachers. That is, they focus on quantity rather than quality. By lowering the entrance bar instead of raising teacher salaries, such strategies maintain teacher salaries at relatively low levels, which may prompt high-quality teachers to leave the teaching profession for other careers. But do higher salaries actually result in increases in the quality of the teacher work force? It is likely that the higher the salary in comparison to other available jobs, the more likely a young person is to go into teaching. This means that higher salaries should result in a larger pool of prospective teachers. However, a larger applicant pool does not necessarily lead to increased teacher quality. If schools and school districts cannot adequately distinguish high-quality teachers from low-quality teachers, then higher-quality prospective teachers who join the applicant pool in response to wages may not be hired and placed in schools. There is also a question of whether schools actually control the teacher hiring process. In some countries, hiring occurs at the district or state level, which means that schools cannot control whether teachers provide an adequate match for their student population. As you can see, the issue of identifying and rewarding teacher quality is a difficult but extremely important issue in educational policy.

2.6 Raising teacher quality through education and training

If it is so difficult to identify high-quality teachers, why can't schools improve the quality of the existing teacher work force through education and training? Such training can take place through multiple routes, including teacher certification and licensing, pre-service training (undertaken prior to entering the classroom), in-service training (undertaken by practicing teachers), and graduate education. Many advocates of teacher "professionalization" suggest that excellent certification programs, postgraduate education, and intensive professional development will result in a cadre of skilled and effective teachers. For example, in a series of influential reports in the United States, Linda Darling-Hammond argued that fully prepared, certified, and well-trained teachers are much more effective than teachers without adequate preparation, certification, and training. A recent report by the OECD supports many of these conclusions, finding that, among other things, certification of teachers is positively associated with greater teacher effectiveness (OECD, "The Quality of the Teaching Workforce").

Other researchers are more skeptical about the effects of teacher training, professional development, and postgraduate education on teacher quality. For example, there is little evidence to suggest that students of teachers with master's degrees perform better on standardized tests than students of teachers without postgraduate degrees. Many economists of education also question the value of teacher certification programs, arguing that these programs have little effect on teacher quality and that, by raising the costs of becoming a teacher, they actually discourage potentially effective teachers from entering the teaching profession. In terms of in-service training, there is little evidence indicating whether such training actually improves teachers' ability to raise student outcomes. However, with the growing availability of data on teachers and students, educational researchers will probably begin to pay more attention to these important issues.

2.7 Activities for Section 2

1. The events listed below could have an effect on either the demand or supply of teachers. For each factor, describe (1) whether the event is likely to affect supply or demand and (2) if the event will result in either an increase or decrease of supply or demand. Explain your reasoning for each answer.
   a. A shortage of nurses causes hospitals to increase nurses' salaries by 50% and to offer large bonuses to pay for nursing education classes. [Answer: since this may cause young people to switch from teaching to nursing careers, the *supply* of teachers should *decrease*.]
   b. A popular television program depicts public school teaching as a glamorous and exciting profession. [Answer: the television show may convince young people that teaching is an interesting and socially respected career. If so, the number of young people who go into teaching should increase, thereby *increasing* the *supply* of teachers.]
   c. The Spanish government allows thousands of political refugees to enter the country. The children of these refugees enroll in Spanish schools. [Answer: due to a sudden increase in the student population, there is likely to be an *increase* in the *demand* for teachers.]
   d. Two years later, all of the refugees return to their countries of origin, taking their children with them. [Answer: now there is a sudden decrease in the student population, so there should be a *decrease* in the *demand* for teachers.]

2. The theory of compensating wage differentials, described in Section 2.4, helps to explain why teachers may demand higher salaries to work in certain types of schools. To determine whether this is true for your own decisions, answer the following questions.
   a. Rank the following conditions that may influence your decision over what type of school you would like to teach in. Place a one next to the most important factor, a two next to the second most important, etc.:
      _____ Availability of instructional materials
      _____ Positive relationship with colleagues and administrators
      _____ Hard-working and respectful students
      _____ High social status associated with working at the school
      _____ Safe and pleasant neighborhood where the school is located
   b. Are any of these factors important enough for you to sacrifice some of your salary to teach at a school where the positive condition exists? If so, which factors? Explain.
   c. If you answered yes on part b, *how much* additional salary would you demand to teach at a school where the positive condition does *not* exist? This amount is your personal compensating wage differential.

   [Answer: answers will vary, but students should use this exercise to examine the ideas behind the theory of compensating wage differentials, and evaluate the validity of these ideas.]

3. According to the *Anuario Estadístico de España 2004* (Chapter 3, page 149)*,* there were almost 4.3 million students enrolled in Spanish primary schools (both public and private) during the 1993-1994 school year. By the 2000-2001 school year, the number of primary students had decreased to less than 2.5 million. During the same period, the number of young people enrolled in teacher preparation programs in Spain increased from 68,748 to 95,550 (p. 176). If the population of students shrinks while the population of prospective teachers grows, what is likely to happen to teacher salaries? Assume that the market was in equilibrium in 1994. To answer this question, do the following:
   a. Draw a figure depicting the supply and demand of teachers in equilibrium. Label the supply curve Q^{S1994}. Label the demand curve Q^{D1994}. Label the equilibrium price P_e and the equilibrium supply S_e.
   b. Draw a new supply curve for 2001 (label it Q^{S2001}), based on what you believe has happened to the supply of teachers.
   c. Draw a new demand curve for 2001 (label it Q^{D2001}), based on what you believe has happened to the demand for teachers.
   d. Where the new supply and demand curves meet, label the price P_{2001} and the quantity Q_{2001}.
   e. What has happened to the price and quantity of teachers employed in 2001? Why do you think this has occurred?

   [Answer: the figure in Part A should show supply and demand in equilibrium. In Part B, the supply curve should shift to the *right* because more people are taking teacher preparation courses, which means that there is probably a larger pool of available teachers. In Part C, the demand curve should shift to the *left*, because the shrinking student population means there is a reduced need for classroom teachers. In Part D, quantity may not change much, but the price (salary) should be much *lower* in 2001. This occurs because quantity demanded is lower while quantity supplied is higher. This means that an increasing number of teachers are willing to work for lower salaries just to get jobs. Students may answer that there will be a

surplus (excess supply) of teachers, but this will only happen if teacher salaries do not fall to adjust to the decrease in demand, as we see in Question 3 below.]

4. From Question 3 above, now assume that between 1994 and 2001, teacher salaries do not change. In other words, the demand and supply do the same thing you described above, but the price of teachers cannot change, due to legislation or resistance from teachers unions. What do you think will happen to the teacher labor market? Do not draw the supply and demand curves, just describe in words what is likely to happen with supply and demand. [Answer: Now there will be a surplus, or excess supply of teachers, because demand has fallen and supply has risen, but price (salary) is not allowed to fall as it does in question 2. As a result, there will be too many teachers for not enough positions. If young people respond by moving into other fields, over time the surplus may be corrected, but this process could take years.]

5. After reading the OECD Observer 2004 policy brief entitled "The Quality of the Teaching Workforce," answer the following questions about what the research tells us about teacher quality and the determinants of teacher supply and demand.
   a. According to the OECD policy brief, how do school systems typically respond to teacher shortages? In your opinion, what is the effect of such strategies on the quality of teachers working in schools? Explain. [Answer: on page 2, the report identifies two responses: (1) lowering qualification requirements and (2) increasing class size or teaching loads. Students will probably respond that these strategies are likely to reduce overall teaching quality.]
   b. According to the policy brief, principals in many OECD countries have had difficulty recruiting secondary teachers in certain subject areas. Study Figure 1 on page 2 of the brief. What are the subject areas in which principals have the greatest difficulties in hiring teachers? Why do you think it is so difficult to hire teachers in these areas? [Answer: according to Figure 1, it is most difficult to hire teachers in computers sciences, mathematics, and technology, followed by foreign languages and sciences. One reason for this difficulty is that young people with the relevant degrees for these subjects probably receive higher salaries in other fields than do people with degrees in physical education or social studies, where positions are less difficult to fill.]

2.8 Supplemental Readings for Section 2

Alberdi, I. (1999). *La nueva familia española*. Madrid : Taurus. Capítulo 7: "El trabajo de las mujeres dentro y fuera del hogar," pp. 229-264.

OECD. (2004). Policy Brief: The quality of the teaching workforce. Available at: http://www.oecd.org/dataoecd/17/9/29478720.pdf.

Instituto Nacional de Estadística. (2004a). *Anuario Estadístico de España 2004.* Capítulo 3: Educación. Available at http://www.ine.es/prodyser/pubweb/anuario04/anu04_3educacion.pdf.

Instituto Nacional de Estadística. (2004b). *Anuario Estadístico de España 2004.* Capítulo 8: Mercado Laboral. Available at http://www.ine.es/prodyser/pubweb/anuario04/anu04_8mercadolaboral.pdf.

3 Teacher Salaries

In this section we focus more closely on the important issue of teacher salaries. Teacher salaries are important because, like any other workers, teachers and prospective teachers care about their compensation and how it compares to compensation offered in other professions. The issue of teacher salaries also illustrates the effect of compensation on teacher behavior—not just whether young people go into teaching, but who decides to become a teacher, where they teach, how well they teach, and how long they choose to stay in the profession. In this section, we first discuss the issue of real versus nominal wages, followed by a discussion of relative wages, or how salaries in teaching compare to salaries in comparable occupations. Then we discuss the use of the uniform salary schedule, the determinants of teacher salaries, and differences in salaries between primary and secondary teachers. We conclude this section with a cross-country comparison of teacher salaries.

3.1 Real vs. nominal salaries

In 1970, a beginning primary teacher in Spain earned fewer pesetas than a beginning teacher in 2000. Does this mean that the new teacher in 2000 was richer than the beginning teacher in 1970? It is impossible to know by simply comparing **nominal salaries** earned by teachers at two different points in time. The nominal salary refers to the original or stated value; it does not take into consideration the effects of inflation on purchasing power over time. To adequately compare salaries at two different times, we must adjust nominal salaries to **real salaries.** Real salaries tell us the actual purchasing power of the salary. To convert nominal salaries to real salaries, we must use an index that compares the costs of different goods at different times. The index used is often referred to as a consumer price index.

As an example of nominal and real salaries, a 2004 report by the OECD (*Education at a Glance: Education Indicators 2004)* uses a "GDP deflator" to adjust 2002 teachers' salaries to compare them to 1996 salaries. The report finds that real salaries for teachers increased in virtually all OECD member countries between 1996 and 2002. The largest increases were in Mexico, where real salaries for beginning teachers increased by more than 40 percent compared to salaries for new teachers in 1996. But in Spain, real salaries in both primary and secondary education actually *fell* during this period: beginning primary and secondary teachers in Spain earned 7 percent less in 2002, in *real terms*, than beginning primary and secondary teachers in 1996. In other words, while nominal salaries for beginning teachers increased during this period, changes in real salaries indicate that the purchasing power of new teachers in Spain actually decreased from 1996 to 2002.

3.2 Relative salaries

As discussed in Section 2, a teacher's relative salary is the salary that a teacher earns in comparison to salaries in similar fields available to prospective teachers. It is important to consider relative salaries when discussing teacher labor markets because most young people compare salaries and working conditions in several different occupations before choosing a career. The relative salary gives us an idea of what a teacher could have earned if he or she had chosen a different career. But what sorts of careers are comparable to teaching? Direct comparisons with other fields are difficult due to a number of unique features of the teaching profession. For example, teachers usually do not work the whole year and their benefits and job security tend to be greater than those in other fields. On the other hand, teachers generally do not earn bonuses, overtime, or other types of income not included in the teacher salary schedule.

While this could mean that teachers earn less on average than teachers in other fields, their salaries are also more consistent and predictable.

Researchers have used many different methods to compare teacher salaries to salaries in other occupations. Early studies simply compared salaries in teaching to salaries in all other occupations. More recent studies compare teacher salaries to the salaries of occupations in which workers have similar levels of education and training as teachers. The National Education Association (NEA), a professional organization representing teachers in the United States, has compared teacher salaries to the salaries of, among others, wage and salary workers, employees in manufacturing, and government employees. To make the salary comparisons complete, the NEA also adjusts for the fact that teachers work on average fewer days than most other workers (Hurley, 2004). A recent report published by the Economic Policy Institute in the United States compares the weekly wages of teachers to the wages of workers whose jobs require the same levels of skills and training. According to this study, workers with similar skill requirements as teachers include accountants, reporters, registered nurses, computer programmers, clergy, personnel officers, and vocational counselors (Allegretto, Corcoran, and Mishel, 2004).

What do these studies tell us about how teachers are compensated relative to workers in other occupations? The NEA's study found that between 1940 and 2000, teachers in the United States lost ground relative to other college-educated workers. In 2000, the average earnings of workers with at least four years of college were more than 50 percent greater than the average teacher salary, the largest difference since a college degree was required to teach in the United States. The study by the Economic Policy Institute found that between 1993 and 2003, teachers' pay fell 11.5 percent in comparison to workers with comparable education and skills. Additionally, in 2002, teachers earned 12.2 percent less per week than workers with similar skill requirements (Allegretto, Corcoran, and Mishel, 2004).

A 2003 report on Spanish teachers asserts that the "professional group most comparable to the work of a teacher would be a person from middle management at a company, who is responsible for a team and has some capacity for decision-making in aspects affecting her/his immediate environment" (Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto, 2003, p. 57). In terms of how salaries relate to other professional groups, teachers' salaries are similar to those in healthcare and natural sciences, but much lower than salaries in engineering, research, and applied sciences. For example, in 2002 the average educational worker with intermediate qualifications earned 24,330 euros, compared to an average salary of 43,597 for a worker in mathematical sciences and engineering. Also, according to another measure of relative salaries—the ratio of teacher salary to per capita GDP—teacher relative salaries in Spain decreased between 1994 and 2001 (OECD, *Education Indicators at a Glance 2004*).

3.3 How are teachers paid?

In much of the world, teachers are paid according to what is known as a "uniform salary schedule," which rewards teachers for the years of experience and the level of educational attainment and training they have received. The near-universal use of teacher salary schedules means that the method of compensating teachers varies little across countries. The only differences occur in features of the salary schedule, such as the minimum and maximum salary

levels, the highest level of training and experience awarded, the number of steps from the bottom to the top, and the value of each step.

The uniform salary schedule eliminates much of the subjectivity and uncertainty that result from rewarding workers on the basis of merit. Teacher merit pay programs have often met resistance from teachers because compensation can seem arbitrary or unfair; teachers have complained that administrators award salary bonuses based on friendships or political considerations rather than actual merit. By encouraging competition among teachers, merit pay programs may also make the teaching environment less collaborative and collegial, reducing collective efforts toward common goals. In the eyes of many teachers, the uniform salary schedule is fairer and more conducive to collaboration than a system that rewards teachers based on the subject they teach, grade level, or effort.

Despite the positive aspects of the uniform salary schedule, some researchers argue that because the schedule awards teachers only according to their longevity and training, they have no incentive to work harder or teach more effectively. Some economists of education argue that if teachers were paid according to the amount that their students learned, they would have greater incentives to work hard and teach well. These economists believe that without proper incentives in place, teachers must either have strong intrinsic motivation or be constantly supervised by administrators to ensure appropriate effort. Since such monitoring rarely occurs, there is likely to be great variability in effort and effectiveness from teacher to teacher.

The uniform salary schedule also does not distinguish between teachers of different subjects or take into account current labor market conditions. For example, a district using a uniform salary schedule pays the same salary to a history teacher and a science teacher with the same level of experience and training. However, in the labor market outside of teaching, the science teacher probably commands a higher salary than the history teacher. This is because someone with a science background is more likely to have access to opportunities in industries that pay more than teaching. As a result, the science teacher may require a higher salary to enter and remain in teaching. Using the model of supply and demand, there are actually two different supply curves for science and history teachers: the supply curve for people with science backgrounds is to the left of the supply curve for people with history backgrounds. This means that at any given salary, there will be more high-quality history teachers than science teachers. Offering the same salary for both types of workers results in a large pool of high-quality history teachers but a smaller pool of high-quality science teachers.

Another potential problem with the uniform salary schedule is that it may reward teachers using criteria that do not adequately distinguish effective teachers from less effective teachers. In other words, educational attainment and experience may not be as important in ensuring high-quality teachers as other factors that the uniform salary schedule does not reward. For example, research in the United States has examined whether students of teachers with advanced degrees perform better on standardized tests than less educated teachers. Much of the evidence suggests that these degrees make little difference. One exception is the case of secondary math and science teachers: there is some evidence that a subject-specific advanced degree contributes to a teacher's ability to raise student achievement in that subject. As for experience, evidence suggests that teachers with three or more years of experience produce better student outcomes than new teachers.

However, the evidence is mixed regarding whether teachers continually improve with experience after the first several years (King Rice, 2003).

3.4 Alternatives to the uniform salary schedule

The uniform salary schedule is prevalent in teaching because there are few attractive alternatives. Efforts to reward teachers' effort and effectiveness through merit pay have met many obstacles. To begin with, schools and districts have had difficulty settling on an appropriate plan to reward teachers. One approach is for school administrators to identify and reward teachers who work harder or teach better. Such plans are difficult to implement because they are based on administrators' subjective evaluations. If teachers perceive these evaluations to be unfair or inaccurate, merit pay plans could result in dissension and an unpleasant, non-collaborative work environment.

Another approach to merit pay is to base salary increases on the performance of students on standardized tests or some other measure of academic performance. Teachers whose students have the largest gains in achievement would receive the greatest salary increases. Of course, such a system also has many problems. Teachers of more economically advantaged students may be more likely to receive awards. To make the reward system fair, districts must use sophisticated statistical techniques to account for differences in student background. However, the more complicated the system becomes, the less teachers understand what they must do to receive a reward. If teachers cannot understand how the incentive system operates, they are less likely to respond to salary incentives. In sum, as problematic as the uniform salary schedule is, alternative approaches also pose many difficult problems.

3.5 Secondary vs. primary salaries

In many countries, secondary teachers have traditionally earned higher salaries than primary teachers. However, the gap between primary and secondary teachers is falling, as salary schedules increasingly apply to all teachers regardless of what level or age of students they teach. Among OECD countries, for example, in 2002 salaries did not differ significantly between beginning primary and upper secondary teachers in Australia, England, Greece, Ireland, Japan, Korea, New Zealand, Norway, Portugal, Scotland, the Slovak Republic, Turkey, and the United States. In Spain, however, there continues to be a significant difference in annual salaries between primary and secondary teachers: in 2002, a beginning upper secondary general education teacher with minimum training earned 16 percent more in annual salary than a beginning primary teacher and 3.6 percent more than a lower secondary teacher (OECD, 2004, *Education at a Glance: Education Indicators 2004*).

Comparisons of annual salaries between primary and secondary teachers obscure the fact that secondary teachers are often required to teach fewer hours than primary teachers. For example, in 2002, upper secondary teachers in Spain were required to teach 548 hours per year, while the requirement for Spanish primary teachers was 880 hours. If we examine the salary earned *per teaching hour*, then on average, upper secondary teachers in OECD member countries earn about 40 percent more than primary teachers. In Spain, upper secondary teachers with 15 years of experience earned $69 (U.S. dollars) per working hour, compared to $38 (U.S. dollars) earned by primary teachers with the same level of experience. In percentage terms, upper secondary teachers earn 82 percent more per teaching hour than primary teachers, the largest difference of

all OECD countries. Of course, teaching hours are not the same as working hours. Teachers spend many non-teaching hours planning lessons and correcting student work. In fact, both primary and upper secondary teachers in Spain were required to work 1140 hours at their schools in 2002 (OECD, 2004, *Education at a Glance: Education Indicators 2004*).

3.6 Determinants of teacher salaries

Many factors affect the salaries of teachers: the size of the student population, the total number of current teachers, their age and qualifications, and the structure of the current salary scale. If the size of the student population decreases while the number of teachers going into teaching grows, there may be more teachers than available positions. The surplus of teachers will likely have a downward effect on teaching salaries, all else equal.

The nature of the salary scale can also have a significant effect on salaries. Since the salary schedule rewards experience and training, districts that employ many experienced and highly trained teachers will pay higher salaries than districts that rely largely on new teachers. As discussed above, salary scales also vary considerably in terms of the minimum and maximum salaries, number of steps, salary increase for each step, and awards for advanced degrees. Salary scales with more steps are likely to result in higher overall teacher salaries, all else equal. Another factor affecting salaries is the presence and strength of teacher unions. We will discuss unions at greater length below, but in general, salaries tend to be higher where a union is present and active in collective bargaining. Finally, economic factors such as the level of per capita income, taxation, and property values—if property taxes play a large part in education finance as they do in the United States—affect the level of salaries available to public school teachers.

3.7 Effects of teachers unions

Unions operate differently in education than they do in many other occupations. Unions in other fields often control who joins the profession by requiring that employees hire only union members. In contrast, teachers unions exercise control not by influencing admission to the occupation, but through collective bargaining, during which unions negotiate salaries and working conditions. Most researchers assume that the union negotiates wages that are above the market-clearing level. If this is the case, then the overall effect of the union should be to increase educational expenditures and teachers' salaries, but to reduce overall employment in education. This is because employers are less willing to hire teachers at the higher salaries negotiated by unions. However, if a union accepts the market-clearing wage, then its effect on salaries and employment levels are negligible.

Of course, the effects of teachers unions on salaries and employment depend on many conditions. For example, if the demand for teachers is growing, then the effect of the union on overall employment should not be as strong as it is if the demand curve remains stable. This is because growing demand should raise employment levels, counterbalancing the downward pressure of unions on the demand for employees. Also, if the demand for teachers is **inelastic**—that is, demand does not change even if prices change—then union demands should not have an effect on employment no matter how high the salaries they negotiate (Cohn & Geske, 1990).

These arguments are based on economic theory rather than evidence from the real world. Do the results of economic studies support the prediction that the presence of unions raises salaries? In

the United States, union members earn salaries that are 10 to 20 percent higher than workers in similar occupations who do not belong to unions. There is also evidence that unions reduce employment levels in the individual firms where they operate (Ehrenberg & Smith, 2000). These results do not necessarily apply to teachers unions, but studies also suggest that the presence of unions has a positive effect on teachers' salaries (Cohn & Geske, 1990).

3.8 The efficiency wage hypothesis

Some researchers in the United States have pointed out that although expenditures on the salaries of public school teachers have increased over time, student achievement levels have not. Does this mean that there is no relationship between teacher salaries and educational quality? Perhaps, but another possible explanation for this phenomenon is the **efficiency wage hypothesis.**

According to the efficiency wage hypothesis, a worker's wage positively affects his or her productivity. In other words, the more a worker is paid, the more he or she will produce, all else equal. For example, economists who study economic development apply the efficiency wage hypothesis to the situation of poor laborers in developing countries. These laborers must earn enough money to purchase an amount of food that will not only allow them to subsist, but will also give them sufficient energy to be productive in their jobs. The wage at which workers earn enough to be productive is known as the efficiency wage. To make sure their workers are productive, employers must pay the efficiency wage, even if it is above the economy's equilibrium wage.

More generally, the efficiency wage hypothesis suggests that some employers will pay their workers above the market-clearing price if they believe they can maximize profit by doing so. These employers may want to encourage greater effort and loyalty on the part of workers, to increase worker morale, and to improve the overall pool of applicants applying for a certain job. In other words, employers may consider it necessary to pay above the average wage in a certain industry in order to recruit high-quality labor. Some economists argue that this practice explains why there is always some unemployment in the economy: by paying an above-market wage, employers cause the supply of workers to exceed demand, resulting in a surplus of labor, or unemployment (Ehrenberg & Smith, 2000).

When applied to teacher labor markets, the efficiency wage hypothesis could explain why in some cases teacher salaries increase over time while teacher quality does not. During much of the twentieth century, teaching was one of the few careers available to college-educated women. Because women did not have opportunities in other fields, schools had a "captive" pool of well-educated women and were able to pay salaries below those of similar fields in which male workers predominated. As social and economic barriers to women's employment fell and more opportunities opened up to college-educated women, many of these women began to choose careers outside of education that have traditionally paid more than teaching. As a result, schools found that just to *maintain the same level of quality*, they needed to increase teacher salaries. In other words, they had to pay a higher new efficiency wage. Such efforts to keep able women in teaching could put upward pressure on teacher salaries and increase educational costs. Conversely, if teacher salaries did not increase, then the loss of high-quality college-educated women to other fields would decrease the overall pool of talent entering the teaching field. In sum, if increases in teacher salaries do not lead to increases in educational quality, this could

mean that there is no relationship between salary and teacher quality. Or it could mean that rising salaries are actually buying less quality, as high-quality young women pursue other occupations.

A related consequence of the largely female composition of the teacher workforce is that, because women on average earn less than men, educational expenditures are probably lower than they would be if men comprised half or more of the teaching work force. Take the example of Spain, where men make up only 22 percent of all primary teachers but constitute almost half of all secondary teachers (46.7 percent). Then look at the difference in salaries between primary teachers and upper secondary teachers: as discussed above, a beginning upper secondary teacher in 2002 earned 16 percent more than a beginning primary teacher. While some of this difference is probably due to greater knowledge requirements for secondary teachers, some of the difference may also be attributable to the greater concentration of males in secondary schools.

3.9 International comparisons of teacher salaries

When comparing teacher salaries across countries, it would be best to compare relative salaries rather than absolute salaries. That is, when comparing Country A to Country B, we would like to know how much a teacher earns in Country A relative to other professions in Country A, and compare this information to similar information in Country B. This type of comparison would tell us, among other things, how the attractiveness of teaching relative to other professions varies from country to country. However, this type of data is not readily available at an international level. Instead, researchers who make cross-country comparisons generally compare teacher salaries to some measure of a country's per-person national income. Many studies calculate a ratio of a country's **Gross Domestic Product** (GDP) per capita to the average teacher salary in that country. For example, a study published by the OECD in 2004 reports that in 2002, Spanish primary teachers with 15 years of experience earned salaries that were 1.5 times Spain's per capita GDP. The GDP per capita tells us how much each Spaniard would receive if the total value of the goods and services produced by the Spanish economy were divided equally among all Spanish citizens. The ratio of 1.5 tells us that the salary earned by a teacher with 15 years of experience earns one and a half times this amount. The ratio is higher for teachers of lower secondary education (1.65) and upper secondary general education (1.7). To examine these ratios more closely, refer to OECD's *Education at a Glance Indicators 2004*, Table D3.1, page 390.

How do teacher salaries in Spain compare to those in other countries of the OECD? Using the ratio of salary to per capita GDP, Spain's 2002 ratio of 1.5 at the primary level was higher than the OECD average of 1.33. The highest ratio among OECD member countries was 2.73 in Korea, while the lowest was 0.54 in the Slovak Republic. In OECD non-member partner countries, the lowest ratio for primary teacher salaries was 0.54 in Indonesia, while the highest was 6.21 in India. While this ratio appears very high, the average salary for an Indian primary teacher with 15 years of experience was $18,247, compared to $33,521 in Spain.

The salary comparisons are calculated in United States dollars using a method known as "purchasing power parity." This approach makes salaries comparable by giving us an idea of how much a teacher can purchase with a given salary. How does Spain compare using this technique? Using the example of a beginning primary teacher in 2002, the Spanish salary of $28,161 was higher than the OECD average of $22,910. In fact, Spain's salary level was the fifth highest among 29 countries, below only the United States, Denmark, Switzerland, and Germany. The lowest salary was $5,134 in the Slovak Republic, while the highest salary was $36,934 in Germany. Along with this good news for Spanish teachers comes some bad news: among both

OECD member and partner countries, Spain was the only country to experience *decreases* in real salaries for both primary and upper secondary levels between 1996 and 2002. During the same period, teacher salaries in other countries increased dramatically, particularly in Mexico (an increase of 42 percent for primary teachers) and Hungary (increase of between 40 percent and 49 percent, depending on experience and level of training).

In addition to differences in teacher salaries across countries, there is also variation in salaries within Spain. According to the report by Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto (2003), primary teachers in Asturias earn the highest salaries of any other region, while Ceuta and Melilla pay the lowest salaries (Table 25). Among secondary teachers, the Basque Country pays the highest salaries, while Andalucia, Ceuta and Melilla pay the lowest salaries. There are also interesting cross-regional differences in the salary range between beginning and experienced teachers. This difference is smaller in the Basque Country (24.9 percent) and the Canary Islands (25.7 percent) and larger in Andalucia (49.7 percent), the Balearic Islands (57 percent), and Ceuta and Melilla (49.8 percent). One possible explanation for these differences is that in the first group, educational authorities hope to recruit new teachers, while in the second group, the objective is to retain veteran teachers (Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto, 2003).

3.10 Activities for Section 3

1. In 1984, the average salary for a classroom teacher in the United States was $21,935. By 2004, the average salary had increased to $46,826. Comparing these nominal salaries, what is the percentage increase in the average teacher salary between 1984 and 2004? If we adjust the 2004 salary to account for the effect of inflation, the salary increase is only 18.9%. What is the value of the 2004 salary after it is adjusted to be comparable with the 1984 salary? [Answer: Comparing nominal salaries, the increase is 113%. But if we multiply the 1984 salary of 21,935 by 1.189 (because there is a real increase of 18.9%), we find that the 2004 salary, adjusted to 1984 dollars, is 26,083.]

2. Examine Table D3.1 on page 390 of the OECD report *Education at a Glance 2004.* This table gives salaries in terms of US dollars, calculated using purchasing power parity, which adjusts salaries to reflect how much purchasing power they represent. Examine the differences in salaries between starting and experienced teachers, between primary and secondary teachers, and among various countries. Answer the following questions:
   a. Where do teachers earn the highest salaries? Why do you think this is so?
   b. What patterns do you see in the differences between beginning and experienced teachers? In what countries do you see the biggest difference between beginning teachers and teachers with 15 years of experience? Why do you think these countries reward their experienced teachers so much more than their beginning teachers?
   c. What differences do you see between primary and secondary teachers? Which countries reward secondary teachers more than primary teachers? Why do you think this is so?
   d. Compare salaries in OECD countries and non-member partner countries. What differences do you see? What do you think explains these differences?

3. Examine Table D3.3 on page 398 of the OECD's *Education at a Glance: Education Indicators 2004* report and answer the following questions:
   a. Which country had the largest increase in real salaries for primary teachers between 1996 and 2002? By how much did primary salaries increase? Why do you think salaries might have increased so much in this country?

b. In general, did real salaries increase more for primary or secondary teachers between 1996 and 2000? Why might this be the case? If you do not see any difference in salary growth between primary and secondary teachers, why do you think this might be?

4. The OECD report *Education at a Glance: Education Indicators 2004*, reports on page 379: "Teachers' salaries have risen in real terms between 1996 and 2002 in virtually all countries, the largest increases evident in Hungary and Mexico. Salaries at the primary and upper secondary levels in Spain fell in real terms over the same period."

a. What do you think this tells you about the economy and supply and demand of teachers in Spain during this period? Refer to Question 3 in Section 2 to answer this question.

[Answer: Answers can vary, but should demonstrate the understanding that increased supply of teachers and/or reduced demand for teachers should have a negative effect on real teacher salaries. In the case of Spain, both of these things happened between 1991 and 2001, as discussed in Question 3 of Section 2. Also, if there was a high level of inflation during this period, it is possible that inflation growth outstripped growth in salaries, regardless of what happened to the supply and demand of teachers.]

b. If you were considering a job in teaching, would this information influence your choice in any way? Explain.

5. Examine Tables 25 and 26 of the report by (Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto, 2003). Which regions in Spain tend to offer the highest salaries? Which regions offer the lowest salaries? Do you see any differences across regions in the relationship between salaries of primary and secondary teachers? Are there differences in how regions pay their beginning teachers compared to the more experienced teachers? How would you explain the differences you find?

3.11 Supplemental Readings for Section 3

Hurley, E. (2004). Teacher pay 1940-2000: Losing ground, losing status. National Education Association, available at http://www.nea.org/edstats/losingground.html.

OECD. (2004). Education at a Glance: Education Indicators 2004. Chapter D, Section 3: Teachers' salaries," pp. 379-398.

OECD. (2004). Education at a Glance 2004. Briefing Note: Spain. Available at: http://www.oecd.org/dataoecd/35/34/33714562.pdf.

OECD. (2004). Repaso a la enseñanza: Indicadores de la OCDE—Edición 2004. Resumen en Español. Available at: http://www.oecd.org/dataoecd/33/24/33713498.pdf.

4 Teacher Career Paths and Mobility

Teachers make many important decisions that influence the quality and quantity of teachers in a nation's schools. This section will examine what we know about how teachers decide to go into teaching, how long they stay, and where they choose to teach.

4.1 Who becomes a teacher?

If you think about the people you know who have become teachers, are they different in any way from your friends and acquaintances in other occupations? Are they smarter, more articulate, less ambitious, or friendlier? If you do not see any significant differences, then you will recognize the difficulty that educational researchers have in determining what types of people go into teaching. For the most part, researchers must rely on measurable characteristics, such as scores on entrance examinations or the reputation of the undergraduate institution they attended. Using such measures, researchers in the United States have found that, on average, young people who go into teaching score lower on standardized tests and graduate from lower-prestige universities than young people who go into other occupations that require a college education (Murnane, et al, 1991). Does this mean that teachers are less intelligent or capable than other professionals? Or does it mean that teaching attracts people whose strengths are not easily captured by measures such as test scores? It is difficult to know without further research not only in the United States, but also in every country concerned with the quality of its teacher workforce.

4.2 Teacher attrition

The length of time that a teacher remains in the profession has an important effect on the size and quality of the supply of teachers. If the attrition rate is high, more replacements are needed every year. If the replacement teachers have little experience, high attrition rates may lead to a reduction in quality of the teaching workforce. But who is most likely to quit the profession? Researchers in the United States have found that new and inexperienced teachers are more likely to quit than more experienced teachers. As these teachers experience the realities of teaching and discover that "teaching is not for them," many of them leave for other professions. The longer a teacher stays in teaching, the more likely he or she is to spend his or her entire career as a teacher (Grissmer & Kirby, 1991). More experienced teachers may stay in teaching because they have become skilled at their jobs and enjoy working with children. Or it may become increasingly difficult for them to get jobs in other fields.

It is clear that younger and inexperienced teachers leave the profession in greater numbers than more experienced teachers, but among these young teachers, who is more likely to leave? Evidence from the United States suggest that young teachers who leave the profession after only a few years have stronger educational backgrounds and score higher on standardized tests than those who remain in teaching. One possible explanation is that these teachers are more likely to score highly on entrance examination required in other fields, opening more opportunities for them outside of teaching. Additionally, teachers of chemistry and physics are more likely to leave within the first several years than teachers of language arts and social studies, probably because people with training in science have greater opportunities in science and industry (Murnane, et al., 1991).

Of course, the decision of young people to leave teaching also depends on salaries in fields outside of teaching. If salaries are much higher in other fields, then more young teachers are likely to leave teaching, all else equal. Research suggests that teachers with more than seven or

eight years of experience are less likely to respond to salaries in teaching or other fields. This means that the degree to which teacher attrition depends on salaries is determined by the number of new teachers in the teacher labor force: the greater the proportion of inexperienced teachers, the stronger the effect of salaries will be on teacher attrition (Murnane, et al., 1991).

In addition to the departure of younger teachers, every year many experienced teachers retire and leave the profession for good. The departure of both young and older teachers every year results in what researchers have described as a "U-shaped curve" of teacher attrition. Many teachers leave the profession after only a few years, so attrition at the beginning of the curve is high—the left side of the U. Over time, as teachers gain experience or as their opportunities in other occupations decline, teacher attrition falls and reaches a minimum level where it remains for many years—this is the bottom of the U. As teachers age, they retire and leave the profession, so the teacher attrition line increases again to form the right side of the U (Grissmer & Kirby, 1991).

The U-shaped curve illustrates that the age of current teachers is an important determinant of teacher attrition rates. If most teachers in the labor force are older, then regardless of the behavior of new teachers, there will be high attrition rates as many teachers retire every year. Conversely, if most teachers in the labor force are inexperienced, there will also be very high attrition rates as many of these new teachers leave for other professions. Consequently it is important for policy makers to consider the age of current teachers when calculating the future demand for teachers.

There is some evidence that teacher attrition patterns are different in Spain than they are in the United States. For example, in the five years prior to 2003, only 16,050, or about one percent of the public school teaching staff, left public school teaching. Workers in the education sector also remain in their profession longer than workers in most other sectors. Additionally, most teachers who leave the profession do so because of retirement or ill health. Only in rare cases do teachers apply to permanently leave the profession (Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto, 2003). In other words, teacher labor markets appear to be more stable in Spain than they are in the United States.

4.3 The teacher reserve pool

At any given time, there are many qualified teachers in a society who are outside of the teacher workforce; these teachers constitute what is referred to as a "reserve pool" of potential teachers. Evidence from the United States suggests that there is a large reserve pool of licensed teachers not working in classrooms. One potential explanation for this large reserve pool concerns the size of the student population. When the population of school-aged children is large, there are many jobs available to teachers and many young people earn teaching licenses. However, if student populations decrease, many of these young people cannot find jobs in teaching and go into other occupations. Many practicing teachers may also lose their jobs. Another explanation for large reserve pools is that many women leave the teaching force to have and raise children. Some of these women eventually return to teaching, but many do not. The important question for policy makers is how to lure teachers in the reserve pool back to teaching during times of teacher shortages. The solution is likely to be a combination of improvement in salaries and working conditions, as well as sensitivity to the concerns of working mothers.

4.4 How do teachers decide where to teach?

Once a young person decides to become a teacher, he or she must then choose a school to work in. Many factors affect this decision, which is based largely on individual teacher preferences. Some teachers care more about salary than the conditions of their school, while others respond more to working conditions. All else equal, however, salaries are likely to have an effect on where teachers decide to teach. Those teachers who have more options—either because they have higher scores on tests or graduate from more prestigious universities—are more likely to take jobs that pay high salaries. For example, some research in the United States has found that school districts that pay more attract higher percentages of teachers who score higher on standardized tests than neighboring districts that pay less (Ferguson, 1991).

As we discussed in Section 2, teachers respond to more than just salaries when deciding where to teach. Teachers also care about working conditions, including the availability of instructional materials, the working environment, and the nature of their students. Teachers' responses to these preferences often result in what researchers refer to as **teacher sorting**. Teacher sorting occurs when teachers are systematically distributed in a way that disproportionately concentrates teachers with certain attributes in schools or classrooms with specific characteristics. For example, if teachers with high levels of education are more concentrated in schools with economically advantaged students than in schools with disadvantaged students, this is an example of sorting of highly educated teachers by student economic status.

Teacher sorting is clearly detrimental to students and schools with characteristics that high-quality teachers avoid. For example, a recent study of teachers in the state of New York finds that the most highly qualified teachers are concentrated in schools with more advantaged and higher-achieving students, while disadvantaged and minority students are more likely to have less skilled teachers. This study also finds that differences in teacher qualifications occur mainly between schools within districts rather than between districts. Because school districts in the United States pay the same salaries regardless of school location, large within-district differences between schools provide evidence that teachers respond to factors other than salary, such as student achievement, race, or socioeconomic status (Lankford, Loeb, & Wyckoff, 2002).

There is also evidence that teachers prefer to teach near their hometowns. This preference to be close to home can result in vicious and virtuous cycles. In towns where there is a strong educational climate, young people are more likely to receive a good education. If some of these well-educated young people become teachers, they are likely to get jobs in the same community and help to perpetuate the strong educational climate. On the other hand, in areas where the provision of education is not as strong, young people who are not as well educated may become teachers in the same area and maintain the low level of educational quality (Boyd, Lankford, Loeb, & Wyckoff, 2004).

The existence of teacher sorting patterns are not surprising in the United States, where teachers have a great degree of control over where they choose to teach. It is less clear whether teacher sorting is common in countries where teacher placement decisions are made centrally by educational authorities or administrators. Centralized decision-making certainly gives education authorities more control over the placement of teachers, but it does not guarantee more equitable

access of students to high-quality teachers. If authorities are committed to educational equity, they may assign teachers so that economically disadvantaged students have greater access to high-quality teachers. Alternatively, if education officials place teachers in schools based on political connections or an attempt to maintain the educational status quo, then teacher sorting is likely to occur. Unfortunately, little is known about teacher sorting patterns outside of the United States, largely because the type of data needed to conduct such analyses is not readily available to researchers.

In the case of Spain, teachers are assigned to their schools by regional education authorities. However, these authorities hold transfer selection processes every two years, in which teachers can apply to transfer to other schools. In fact, approximately 25 percent of teachers in the pubic education apply to participate in this transfer selection process. This allows for the possibility of teachers sorting into certain types of schools, but the potential for such sorting is limited, as less than one-third of teachers are granted their requests to change schools (Sanz Vallejo, Ortiz Gordo, & Alvarez Prieto, 2003).

4.5 Globalization and immigration

Increasing economic, social, and cultural interaction among nations is likely to have many effects on national public education systems. One clear trend, for example, is the growing attention paid to international achievement tests such as the PISA and TIMSS. Another effect of globalization is the increasing mobility of labor across national borders. So far, this mobility has occurred primarily within two groups: those whose specialized knowledge and high level of training are the object of competition among industrialized nations, and those who cross national borders primarily to engage in low-skill, poorly paid jobs that are not filled by native-born workers. In other words, labor is most mobile in areas where there is the greatest demand.

How has globalization affected the mobility of classroom teachers? With the exception of higher education, globalization has not greatly increased the mobility of educational professionals. To begin with, language can be an obstacle for teachers who are not multi-lingual. National licensing requirements also impede the mobility of teachers seeking jobs outside the countries where they received their training. Schools and districts may also be concerned that immigrant teachers will not be able to adequately inculcate children with the national values and traditions that many see as the cornerstone of the public education system.

Yet as with any other commodity, increasing demand for certain types of teachers could drastically affect the mobility of teachers across national borders. For example, the state of the California recruited teachers from Spain and Latin America to fill the need for bilingual teachers in the 1980s and 1990s. In this case, licensing and cultural issues were superseded by the need for Spanish-speaking teachers. This example illustrates the possibility that, although classroom teaching is often seen as an extremely sedentary profession, the increasing effects of globalization could make for dramatic changes in the future.

4.6 Activities for Section 4

1. In Spain and most of the world, women make up a very large percentage of primary teachers, but a smaller percentage of secondary teachers. In your opinion, what cultural, economic, or social factors explain this pattern? What effect do you think this pattern has on the supply and salaries of teachers in primary and secondary schools?
2. The teacher workforce in Spain tends to be very stable, with few teachers leaving the profession every year. How do you think this would change if the Spanish government attempted

to cut costs by firing all teachers with more than five years of experience? Do you think attrition rates would increase or decrease? Explain.
3. According to researchers in the United States, teacher sorting leads to inequities in the access of children to high-quality teachers. In your opinion, are teacher sorting patterns likely to be more or less pronounced in Spain than in the United States? Explain.

4.7 Supplemental Readings for Section 4

OECD. (2004). Teachers Matter: Attracting, Developing and Retaining Effective Teachers. Executive summary of international conference, November. Available at: http://www.minocw.nl/congres_ocw-oecd/doc/executive_summary_en.pdf.

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Resumen
This module explains the tools and perspectives that economists use to study the behavior of teachers throughout their careers. There are several benefits to approaching these issues from an economics perspective. First, it is clear that teachers respond to economic forces when deciding whether, where, and how long to teach. But an economics perspective also allows us to examine how teachers respond to non-monetary incentives when making important decisions. Additionally, applying the supply and demand model to teachers provides us with valuable insights into the reasons behind shortages, surpluses, and salaries of teachers, which is important information for teachers, school administrators, and educational policy makers. Economics also provides prospective and practicing teachers with a way to assess the costs and benefits (both monetary and non-monetary) of selecting teaching over alternative professions. Finally, using economic models and tools to study teacher labor markets illuminates the importance of teachers in improving educational quality, and suggests how educational policies might be designed to address the concerns of teachers while improving the quality of schools.

Main Lessons of This Module:

1. Incentives matter in determining teacher behavior—teachers respond to salaries in deciding whether to teach and how long to teach; they also respond to working conditions, such as the availability of instructional materials, administrative support, and the characteristics of their students.
2. Demographics are important in determining the composition of the teacher work force and whether prepared teachers find jobs. In times of large student populations, there tend to be shortages of teachers, but when the size of the student population decreases, teacher surpluses often result.
3. While it is important to discuss the overall supply and demand for teachers, policy makers and educational planners must devote more attention to more focused issues, such as the supply of teachers of certain subjects, the quality of people entering and staying in teaching, and the willingness of high-quality teachers to work in certain geographical areas.

Glosario

Compensating wage differential: the salary difference that workers demand to work at less desirable locations

Complement: a good or service that is consumed together with another good or service; for example, shoes and socks are complements.

Derived demand: demand that is derived from the goods and services that labor produces

Efficiency wage theory: the theory that some employers are willing to pay above the market-clearing wage in order to maximize profits

Elastic demand: demand for a good or service that is affected by changes in the price of the good or service; generally, rising prices decrease demand and falling prices increase demand

Equilibrium: state of the market in which supply is equal to demand at the market-clearing price

General equilibrium analysis: the study of the markets of all goods and services in the economy and the effects that each has on the other

Gross Domestic Product: a measure of the market value of all goods and services produced within a country in a given year

Inelastic demand: condition in which changes in prices do not affect demand

Labor market: market in which human labor services are bought and sold

Market-clearing price: the price at which supply and demand are equal to each other

Nominal salaries: the original or stated value of a salary at a given point in time, without considering the effects of inflation on purchasing power

Opportunity cost: the earnings one forgoes due to a decision not to engage in some economic activity

Partial equilibrium analysis: the study of the market of just one good or service, without considering the interaction of this good or service with others

Public good: a good that (1) cannot be denied from the general public (the good is non-excludable) and (2) can be consumed by any number of people without decreasing the benefit to each (the good is non-rival)

Real salaries: refers to the actual purchasing power of a given salary at a particular point in time, accounting for the effects of inflation over time

Module 4: Teacher Labor Markets

Relative salary: the salary that a teacher earns in comparison to salaries in similar fields

Shortage: non-equilibrium situation in which quantity demanded exceeds quantity supplied

Substitute: a good or service that can be used in place of another good or service

Surplus: non-equilibrium situation in which quantity supplied exceeds quantity demanded

Teacher sorting: systematic distribution of teachers that results in disproportional concentrations of teachers with certain attributes in schools or classrooms with specific characteristics

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