

**The Case of the Simultaneous Teacher Shortages  
and Surpluses: A New Example for Teaching  
About Labor Markets**

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**The labor market for teachers**

This paper uses the principles of shortages and surpluses to show that the so-called Ateacher shortage@ is actually a market phenomenon easily understood by undergraduates armed with a grasp of some basic economic principles. Using supply and demand analysis, they can understand what befuddles journalists and pundits: Due to a type of wage control, set through salary schedules negotiated between teacher unions and school districts, there are both shortages of teachers in some specialty areas and surpluses of teachers in other specialty areas, not an overall teacher shortage.

**Simultaneous shortages and surpluses**

The arrival of each new school year has often been accompanied by a flurry of local and national news reports describing a looming national teacher shortage. With doomsday rhetoric, journalists and pundits quote the predictions by the National Center for Education Statistics (Gerald & Hussar, 1998) of the need for about 2.2 million teachers over the next ten years. The National Center for Education Statistics attributes the problem to increasing student enrollments and an anticipated increase in teacher retirements. A *New York Times* editorial appearing on August 23, 1999 picked up the story and proclaimed that AMoney Can't Buy Good Teachers.@ This writer explained the seriousness of the impending shortages. He identified the culprits as bureaucratic public schools and under funded college and university teacher

preparation programs. On September 25, 2002 a second *New York Times* article announced that "Teacher Shortages Vanish When the Price is Right." Here the writer describes that widespread shortages don't really exist. He notes that there is "a big pool of qualified teachers out there." Writers seem confused on the matter of teachers shortages and surpluses.

Two critical points are missed by these accounts by the National Center for Education Statistics and, subsequently, the media. First, press reports of the looming teacher shortage routinely ignore data suggesting that some states actually still have teacher surpluses. Bradley (1999) acknowledges that the supply of teachers varies between states and within states. Some school districts have hundreds of applications for nearly every job while others in less desirable areas face shortages. Connecticut, Minnesota, New York, Pennsylvania, and Wisconsin consistently produce teacher surpluses while other states like California, Nevada, and Texas generally face shortages.

Second, an economic analysis -- similar to the approach used in the principles of economics course in regard to labor markets -- is *never* offered as an explanation of the dislocations in the labor market for teachers. We think undergraduate students would benefit from learning how the basic tools of economics can reveal new insights into a problem that is widely reported but rarely understood.

### **How can we simultaneously have too many and too few teachers?**

Pre-college teaching is often regarded in the media as one labor market--a market for a generic teacher. In fact, the teacher labor market involves school districts competing in dozens of labor markets. A person trained as a physics teacher, for example, has more job alternatives in the private or non-profit sectors than a person who is trained as an elementary teacher. Similarly, teachers of Spanish, physics, mathematics, and chemistry are often in short supply as are technology teachers, science teachers, and speech pathology teachers. Teachers of English, social studies, elementary

education, and early childhood education, however, are much more abundant.

The reason for simultaneous shortages and surpluses is the widespread use of salary schedules negotiated today between boards of education and teacher unions. The salary schedule sets one salary for a generic teacher--as if all teachers had the same marketable skills and therefore the same opportunity costs. The only variations in the nearly universal use of the salary schedule are provisions of higher compensation for more years of teaching service and for earning more college credits or advanced degrees.

Kershaw & McKean (1962) describe the beginnings of the salary schedule for teachers. It emerged in the 1920s, long before the domination of teacher unions in negotiations of teacher pay. The authors maintain that system was established largely in response to teacher complaints regarding the difficulty of individual teacher negotiations with school boards and due to a widespread sense that pay rates set through individual negotiations were arbitrary. Kershaw & McKean (1962) note that the movement toward a common salary schedule was largely an effort to equalize the salaries of elementary teachers to those of high school teachers. Another hope was that equalized pay rates would raise the status of the profession.

The salary specified for a teacher by the salary schedule is insensitive to the actual conditions in the labor markets in which school districts compete. For early childhood teachers, for example, the specified salary acts as a price floor. In other words, the salary for early childhood teachers is actually set *above* what the market price would be for a person offering these skills. At this level, the specified salary serves as an incentive to attract more people into the field than there are positions available. The result, of course, is a surplus of early childhood teachers.

The specified salary for teachers is, simultaneously, a cause of the teacher shortages. For technology teachers, for example, the specified salary acts as a price ceiling. In other words, the salary for technology teachers is actually set *below* the market price for a person with these skills. This specified salary serves as a disincentive to

technology teachers. It discourages people from entering the field because they have better opportunities in other labor markets. The result, of course, is a shortage.

Figure 1 shows how the specified wage system creates both surpluses and shortages. A two-panel diagram can only show two such markets, but that extension from one to two makes the essential point of lifting the student thinking out of the more limited analysis of one market. Thus, the two panels together show the simultaneous shortage of mathematics teachers and surplus of early childhood teachers at the common salary schedule wage,  $S$ . At that wage rate the shortage of math teachers is shown by the distance  $AB$  in panel (a) and the surplus of early childhood teachers is shown in panel (b) by the distance  $MN$ . Of course, the equilibrium wage rate of math teachers lies at point  $E$  above the specified wage. The equilibrium wage rate of early childhood teachers lies at point  $F$  in panel (b) below the specified wage.

Note, too, that the pernicious effect of these shortages is not suddenly imposed on math teachers already produced. Instead, they are infused into the educational and career paths of all those who are capable of learning higher math and who have potential as teachers. As



soon as they become alert to their opportunities, perhaps as early as their high school years, they will realize that those math-oriented jobs in industry and government pay much more than do jobs in elementary or high school teaching. As a result, the specified salary ceiling plays a very early role in reducing the number of people with math talent who even get on the job path toward school teaching.

### **Is the market for teachers different?**

While the analysis presented so far may appear uncontroversial, your more candid college students will object to it. They will argue that labor markets for teachers are somehow different than other labor markets. Some will claim, for example, that paying teachers more or less won't change the situation of surpluses and shortages. Teachers, after all, are not in it for the money. Or, the money available will be insufficient to make any difference. This claim offers a good opportunity to review the basic assumptions regarding the supply curve. Students wondering if salary levels matter are confusing a change in supply with a change quantity supplied. Remind the class that the position of the supply curve for labor is established by a combination of factors including anticipated levels of job satisfaction, benefits, working conditions, and so forth. The position along the supply curve is determined by the wage rate. Proposals calling for market forces to govern teacher salaries are referring to movements along the teacher supply curve rather than a shift in supply.

There are many labor markets for teachers, not just one. In a market where there is a regional shortage of secondary foreign language teachers, we would expect that salary increases would eventually result in a movement upward along the supply curve to a point of equilibrium. In another market, like a regional surplus of early childhood teachers, we would expect that salary decreases would eventually result in a movement downward along the supply curve to the point of equilibrium.

Not satisfied, some students might raise concerns regarding teacher morale. Wouldn't it be hard for teachers to work together knowing that great salary differences exist among them? This objection offers an opportunity to point out that enhancing the morale of employees is not the primary purpose of producers in either the private or public sectors. The overriding feature of private and public sectors is to produce the best possible quality goods and services at the lowest possible cost. We would consider it a good bargain to trade a little teacher morale for improved student performance in math and science.

An instructor might point out further that in most organizations, we would expect large variations in compensation for people in different markets. This is another example of the importance of compensating employees for their opportunity cost. Organizations that require the talents of many sorts of people compete in diverse labor markets to obtain those talents by paying market rates. The Bureau of Labor Statistics reports that in 2001 management occupations have a mean annual wage of \$70,800 and computer and mathematical occupations have a mean annual wage of \$60,350. Occupations involving education and training have a mean annual wage of \$39,130 while people in sales have a mean annual wage of \$28,920.

The facts of contemporary labor markets for teachers offer additional evidence of the dislocations caused by the universal use of the salary schedule. We will comment on only two such features. First, we would expect that those school officials faced with teacher shortages would devise ways to depart from the salary schedule. This is indeed the case. Some School districts are experimenting with ways to offer incentives to teachers. For example, 27 states are currently offering scholarships or forgivable loans to prospective teachers. Some states like Massachusetts and Texas are experimenting with pay bonuses to teachers.

Second, we would expect a relatively high amount of turnover in a labor market that systematically pays below market rates to employees with higher opportunity costs. A recent analysis of data from the U.S. Department of Education (Boser, 2000) reveals that nearly 20 percent of the 1992 college graduates who began teaching by 1993-94 left after three years. Moreover, those who actually teach have relatively low test scores. College graduates who actually taught in public schools by 1996-97 were much less likely to have score in the top quarter (14 percent) on the SAT or ACT than those who chose other professions (24 percent).

### **So, where are the teacher-less math classes?**

This is not the whole story of the shortage and surplus problem. It is far more pernicious than just the creation of shortages of math teachers. If that were the end of the story, there would be far fewer math courses being taught than now, and presumably a parent revolt. What happens instead is that public schools work in cooperation with state departments of education to provide emergency certification to many teachers who do not have certification in the fields of shortages, such as math in our example. Wisconsin -- a teacher surplus state -- issued 1,871 emergency licenses in 1996 (Schug and Western, 1997).

The shortage induces both demanders and suppliers to seek a reduction in quality. The inclusion of teachers teaching outside their field increases the supply of teachers of mathematics. Because the teachers in surplus fields have a hard time finding a job in their field of certification, they have a strong incentive to apply for emergency certification in fields like math. Similarly public school administrators have an incentive to shift teachers into courses for which the teachers have little expertise. The surplus teachers want a job, and the school officials want a teacher in front of the classroom. Barred by the salary schedule from doing what a private firm (and a private school) would do -- i.e., raise pay to alleviate the shortage and attract qualified math

teachers -- they are forced by the shortage to hire the readily available teachers from the surplus pool and provide them with emergency certification in a field for which they are not trained. This is why we can have an economic shortage without empty classrooms.

Figure 2 shows how to modify Figure 1 to incorporate the effect of teachers teaching outside their specialty. The effect of this is shown in Figure 2 in panel (a) by a shift of the supply curve to the right from Supply  $_1$  to Supply  $_2$ . Note, too, that as an analytical matter, the shift of the curve is due to a quality reduction as the numbers of teachers of mathematics increases. This, of course, does not solve the shortage problem, but merely hides it!

The result is predictable: math courses are taught by people who never really liked math and were not particularly good at it. They lack the love of their subject and insight into its mysteries requisite to sparking student interest. They do an uninspiring job and exacerbate the nation's poor performance of students on math achievement examinations.

As is always the case with price controls, there are winners and losers. While the students and parents lose, the teachers in the surplus fields gain in the short run. Through emergency certification, they have jobs. And, through the negotiation of a common salary schedule their salaries are raised above their market level. In the long run, however, teachers are sheltered from the competitive forces that would earn them the kind of professional respect which so many seek.

## **Conclusion**

We contend that teaching about the contract-specified salaries is an excellent way to provide fresh and contemporary insights into teaching about labor markets. It also allows college students to observe the potential for damage when the powerful forces as the laws of supply and demand are ignored. A Swedish (socialist) economist Assar Lindbeck asserted, "In many cases rent

control appears to be the most efficient technique presently known to destroy a city--except for bombing.@ We might say, AIn many cases, salary schedules that set wages for teachers is the most efficient technique presently known to destroy American education--except for bombing.@

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**FIGURE 2: SHORTAGE APPARENTLY RELIEVED BY TEACHERS TEACHING OUTSIDE THEIR FIELD OF SPECIALTY**

