chapter 35

Schooling II: Governance and Financing

Knowledge, learning, information, and skilled intelligence are the new raw materials of international commerce and are today spreading throughout the world as vigorously as miracle drugs, synthetic fertilizers, and blue jeans did earlier. If only to keep and improve on the slim competitive edge we still retain in world markets, we must dedicate ourselves to the reform of our educational system for the benefit of all—old and young alike, affluent and poor, majority and minority. Learning is the indispensable investment required for success in the "information age" we are entering.[1]

LEARNING OBJECTIVES

By reading this chapter, you should be able to:

- Recognize the principal legal developments that have affected the U.S. schooling system.
- Explain the principal characteristics of private, public, and charter schools, which are the three main organizational forms of schools in the United States.
- Understand why the governance and financing of the schooling system are fundamentally distinct concepts.
- Articulate the benefits and drawbacks of financing schools using a voucher system.
- Recognize the alternative options that are available for financing schools and their likely effect on school quality.

Chapter 34 presents evidence that circumscribes total expenditures on U.S. schools and colleges as well as their overall efficacy. As we saw there the performance of U.S. high-school students appears to be, at best, just holding steady over time and, at worst, in a chronic state of decline. Moreover, the international evidence makes for grim reading. For example, the Third Trends in International Mathematics and Science Study (TIMSS), carried out in 2003, found that U.S. eighth graders ranked 19th out of 38 countries in mathematics and 18th in the sciences; the United States ranked slightly above the Republic of Macedonia and slightly below Latvia.

These facts are especially concerning: national excellence in mathematics and the sciences is now well understood to be a major impetus behind economic growth. As an immediate corollary of this fact, if the problem is not fixed, then it could be a harbinger of an impending decline in the relative performance of the entire U.S. economy. Hence both the public and policy makers alike are, with ever greater urgency, seeking to understand the root causes of the apparent lackluster performance of the U.S. educational system.[2]

Of course, one method of addressing the problem is just to spend more on education. The trouble is that the United States already ranks at the top of the list of developed nations in terms of total educational expenditures, which now exceed $500 billion per annum (in 2001 dollars).

If the root cause of the problem is not the level of expenditures, perhaps it is located in the way that schools are governed and financed. Broadly speaking, *governance* refers to who has control over the school in matters such as setting tuition rates, the curriculum, methods of instruction, teachers' pay (and human-resource practices more broadly defined), and admissions. *Financing* refers to who foots the bill and the means whereby funds are raised to cover educational expenditures. Governance and financing are clearly central aspects of any educational system. Their careful study holds out the promise of enabling policy makers not only to better formulate policies that can reverse the academic-performance trends just described but also provide taxpayers with better value for money for the billions of dollars that are spent annually on education.

35.1 Overview

To understand the current nature of the U.S. educational system, it is crucial to have at least some basic familiarity with the history of some of the key legal and policy developments that have taken place over the years. Accordingly, Definition 35.1 offers a selective summary of some of the most pertinent changes that have occurred over time.

Organizational Forms

Currently, U.S. schools belong to one of the following three organizational forms:

- **Private schools** Private schools are nongovernment run institutions. In the United States, the vast majority of private schools enjoy a nonprofit status. In 2003 approximately 5.3 million children—approximately 11% of kindergarten through 12th-grade (K–12) students—were enrolled in the 27,000 schools that constitute the private sector.[3] Almost 80% of them were enrolled in a school that had a religious affiliation and, among this group, roughly 75% attended Catholic schools.

- **Public schools** Public schools are governed either by a local or state school board. They are tuition free and are financed by tax revenues (often collected from local property taxes). In 2003, over 47 million students were enrolled in the public school system.

- **Charter schools**   Charter schools are:

  [I]ndependent public schools designed and operated by educators, parents, community leaders, educational entrepreneurs, and others. They are sponsored by designated local or state educational organizations, who monitor their quality and effectiveness but allow them to operate outside of the traditional system of public schools.[4]

One of the principal features that differentiates these three organizational forms is the degree of control the school's own management (e.g., the principal) can exercise over the way the school is run. Thus the public school system consists of a Daedalic array of control arrangements that are distributed among the school district, the state, and the school's own management. In contrast, the managers of private schools enjoy much greater autonomy in the decisions they make. For example, they can set the curriculum, design and implement teacher incentive schemes, and set the school's tuition rates.

In recent years, policy makers have encouraged the formation of charter schools. This initiative is rooted in the firm belief that the key to improving the efficacy of the public school system is to give the school's management much greater autonomy (i.e., control) over how the school is run. Indeed, increasingly charter schools are viewed as the ideal model for the new public schools of the 21st century,

> Charter schools provide many children with a first-class education, and they have gained national recognition for their accountability standards, innovative programs, and success with young people. The high expectations they set and the opportunities for development they create help students attending charter schools realize their potential and achieve their dreams.[5]

From the outset, it is important to appreciate that the problems of how to optimally *run* (i.e., govern) schools and how to optimally *finance* them are conceptually quite distinct. At one extreme, the school system could be predominantly publicly run and financed—as it is currently in the United States. At the other, every school could charge tuition and be privately run for profit. Between these two polar extremes, there are, of course, a host of other possibilities. One option that is increasingly in the policy limelight is the use of school vouchers (a topic that is described in detail in the next section).[6] In one variant of the voucher scheme, parents are free to use their vouchers to purchase educational services from private, public, or charter schools.

DEFINITION 35.1 Legislative Landmarks in Education

- **Establishment clause of U.S. Constitution**—led to the separation of church and state:

  Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof (First Amendment to the U.S. Constitution).

- **State Constitutions**—were amended during the mid to late 19th century and required tuition-free publicly provided education.[a]

- **Title IV of the Civil Rights Act of 1964**—calls for the desegregation of public schools. In essence, the promulgation of the Act gave the 14th Amendment to the U.S. Constitution greater bite.[b] Thus:

  "Desegregation" means the assignment of students to public schools and within such schools without regard to their race, color, religion, sex or national origin, but "desegregation" shall not mean the assignment of students to public schools in order to overcome racial imbalance.

- *Serrano v. Priest*—this case was brought before the California Supreme Court in 1971. The lawsuit alleged that state funding violated the 14th Amendment of the Constitution, which requires equal treatment under the law. At the time, California (like many other states) financed educational expenditures using local property taxes. The plaintiffs argued that these funding arrangements discriminated against poor students because taxes—and so educational expenditures—depended on the community's wealth. In 1973, the U.S. Supreme Court ruled that local funding arrangements do *not* violate federal law. Nevertheless, suits similar to *Serrano v. Priest* have been won against several other states because of a violation of stricter state laws.

- **The Federal Equal Education Opportunities Act of 1974** stipulates that no state may deny equal education opportunities to an individual on the basis of race, sex, or national origin.

- **Proposition 13** was overwhelmingly approved by California voters in 1978. It cut California's notoriously high property taxes by 30% and capped their future rate of increase. Following its passage, almost half of the states have promulgated similar restrictions.

- In *Zellman v. Simmons-Harris* **(2002),** the U.S. Supreme Court upheld the use of school vouchers, even when they are used to pay tuition fees at private religious schools. This law will arguably have a dramatic effect on the future development of education in the United States.

Source: *Encyclopaedia Britannica,* various entries, 2009. Available at www.britannica.com (accessed July 11, 2010).

---

[a] The constitution of the State of Texas (1869) appears to be typical, "The Legislature shall establish a uniform system of Public Free Schools throughout the State."

[b] Section 1 of the 14th Amendment asserts, "No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."

No-Child Left Behind (NCLB).   The No-Child Left Behind Act is the single most important contemporary policy change targeted at improving the educational system. The act was signed into law by President Bush in January 2002 and includes the three following principal directives:[7]

- **Monitoring.** The act calls for monitoring the performance of public schools and establishing incentives that reward *good* schools and *punish* bad ones.

  Schools must craft annual district report cards that detail educational progress. Those schools that do not make progress must provide supplemental services (such as free tutoring or after-school assistance). If they still fail to make adequate progress after 5 years, then dramatic changes must be made in the way the school is run.

- **Parental Choice.** The act gives parents greater flexibility in their choice of schools. In particular, the legislation is designed to give those parents whose children attend poorly performing schools more choices. Thus:

  Parents with children in schools that do not meet state standards for at least two consecutive years may transfer their children to a better-performing public school, including a public charter school, within their district. If they do so, the district must provide transportation.

- **Funding Flexibility.** The act gives the states greater flexibility in how they can use federal funds to finance education. One of the main aims of the legislation is that the states will use this additional flexibility to target weak areas, such as hiring qualified teachers and improving overall teacher quality.

35.2 Private vs. Public Schools: Governance

> Education is today largely paid for and almost entirely administered by governmental bodies or non-profit institutions. This situation has developed gradually and is now taken so much for granted that little explicit attention is any longer directed to the reasons for the special treatment of education even in countries that are predominantly free enterprise in . . . philosophy. The result has been an indiscriminate extension of governmental responsibility.
>
> —*Friedman* (1962)[8]

Much of the recent brouhaha regarding the apparent sorry state of public education in the United States stems from the perceived failure of schools to deliver satisfactory results in a cost-effective manner. In this section, we examine whether a market-based approach might ameliorate matters.

Competition and Schooling

Almost 50 years ago, Friedman (1962) advocated that the best way to address the problems that plague the schooling system would be to unleash the forces of competition by (in essence) forcing schools to compete for students.[9] The argument is simple. Schools that fail to perform satisfactorily will also fail to attract students. Ultimately, they would be forced to improve their quality or else be forced out of business. The market mechanism creates just the right incentives: it rewards excellence and punishes failure.

Private vs. Public Schools. While the competitive argument is all well and fine on paper, it immediately raises a question: Does the available evidence suggest that private schools—which, after all, currently *do* compete for fee paying students—perform any better than public ones?

In an influential study, Coleman, Hoffer, and Kilgore (1982) explore this issue using data on over 20,000 students that were generated in the first wave of a survey conducted by the National Center for Education Statistics for the 1980 High School and Beyond Survey (HSB). Their results are striking because they suggest that private (Catholic) schools perform better than public ones in fostering student achievement in general and minority student achievement in particular.[10]

Over the almost 30 years that have elapsed since the publication of their paper, Coleman et al.'s findings have been subject to rigorous scrutiny and careful re-evaluation. To appreciate the main issues involved in this reappraisal, recall from

Section 34.2 that estimating an educational production function poses considerable challenges. The trouble is that to assess the performance of public vs. private schools it is necessary to deal with the double headache of estimating two educational production functions—one for each type of institution. Worse still, there are strong grounds for suspecting that the students who attend each type of school may differ systematically in ways that are unobservable to the econometrician, leading to the econometric problem of *selectivity bias.* Statistically speaking, this sort of bias is potentially fatal because it means that one type of school erroneously may appear to perform better than another just because it attracts higher ability students: the students are better, not the quality of education delivered by the school.

Several studies have explicitly controlled for the selectivity bias problem. Evans and Schwab (1995) measure the relative effectiveness of public and (private) Catholic schools using high-school completion and college-attendance rates. Their findings confirm the earlier results: Catholic schools do seem to make a difference. In fact, they find that, relative to public schools, Catholic schools increase the probability a student will attend college by about 13%. Neal (1997) finds that the effects of Catholic schools vary according to whether it is an urban or suburban school and the backgrounds of the students under consideration. Thus urban Catholic schools significantly increase educational attainment levels of urban minorities, have little effect on urban Whites, and have a negligible effect on the performance of suburban Whites. Sander (1996) uncovers positive effects of attending a private school. Most interesting, his results indicate that the beneficial effects of private schools are concentrated in the population of *non-Catholic* students (who attend Catholic schools). Sander (1999) further investigates the issue but finds Catholic schools have little effect on the performance of proximate public schools, which indicates that their presence exerts little competitive pressure on the public school system.[11]

School Vouchers

At a trivial level, the United States already employs a vast public voucher system. Notionally, school districts provide parents with a voucher that covers the full cost of tuition at one and only one public school selected by the district itself. Given this already near universality in coverage, it follows that the advocates of school vouchers must mean something else when they call for their use to be expanded. They, of course, do. What proponents really want to see is a transfer of authority from the school district to parents regarding the choice of the schools at which their vouchers can be redeemed.

There are many different types of voucher schemes that are available to policy makers. At one extreme, parents could be permitted to use their vouchers to send their children to any public school in a given school district. At the other, vouchers could be fully fungible, with parents free to use them to send their children to

any school—either public or private—in the union. Economic Application 35.1 discusses the quantitative effects of some of the best-known voucher schemes implemented in the United States.

ECONOMIC APPLICATION 35.1

School Vouchers: The Evidence

The evidence concerning the effects of voucher programs in the United States is quite scant, being hampered by a plentiful lack of hard data. The two best known public sponsored programs are those that operated in Milwaukee and Chicago. (In-depth discussions of the Milwaukee program and the Chicago public school system are provided by Witte (1999) and Cullen, Jacob, and Levitt (2000), respectively.)

In 1990, Milwaukee became the first city in the country to implement a voucher program that paid the tuition costs of attending (non-sectarian) private schools. The program covered initially only 1% of students and was targeted at children from low-income families. Attrition rates from the program, however, were very high: only 50% of those students who were assigned a voucher remained in private school after two years. Rouse (1998) empirically assesses the effects of the Milwaukee program and finds that the use of vouchers led to a significant improvement in student performance, as measured by their math scores.

An important aspect of Rouse's work is that she uses sophisticated econometric methods to carefully control for the sample attrition just mentioned. Attrition is problematic because those who remain in the sample may differ systematically from those who leave it, leading to biased estimates. For example, suppose there is a proclivity for the parents of high-ability children to keep them in the voucher program (since they arguably benefit most from it). In this setting, the sample attrition effect could lead to an overly rosy assessment of the benefits of vouchers for the simple reason that high-ability children tend to perform well in any school they attend.

Private voucher programs have also been used in New York, Dayton, and Washington, D.C. Howell and Peterson (2002) assess the performance of these schemes. They find that they substantially improve the performance of minority students but have little effect on the performance of White students. The *New York City choice program* experiment commenced in May 1997. It allowed low-income public-school students, in grades K–4, to participate in lotteries for scholarships that would cover tuition costs at private schools. Krueger and Zhu (2003) find that, in contrast to previous studies (such as Howell and Peterson (2002)), the voucher system had a negligible effect on student performance.

The use of vouchers has been pursued more vigorously internationally than in the United States. In 1991, the Colombian government initiated a large scale voucher program, PACES, to improve the average educational attainment levels. Vouchers were targeted at some 125,000 disadvantaged children. Angrist, Bettinger,

Bloom, King, and Kremer (2002) use data from this experiment to explore the effects of this large scale voucher program. They find that the program had a significant beneficent effect on student performance:

> Our findings indicate that . . . programs like PACES can be a cost effective way to increase educational attainment and academic achievement, at least in countries like Columbia with a weak public-school infrastructure and a well developed private-education sector.[12]

In contrast, the results from other international studies are less comforting. McEwan and Carnoy (2000) assess the relative effectiveness of private and public schools in Chile. They find that non-religious voucher schools (which account for two-thirds of voucher enrollments) are marginally *less* effective than public schools. ■

Proponents of voucher schemes see them as providing a golden opportunity to transform American schools for the better because they offer a means of unleashing the beneficent forces of market competition into the heart of the educational system. Indeed, on paper at least, the pro-competitive arguments of the voucher system appear to be compelling. Yet, as with most things in life, the devil is in the details! A system that uses fully *fungible vouchers* would assuredly transform the face of American education. The 500 billion dollar question is, of course, whether it would be for the better. On this score, there are several concerns.

In particular, in order that the competitive process work as intended low-quality schools must lose existing students and fail to attract new ones. Only then can the market weed out failing schools and reward high-quality ones. Nevertheless, Hanushek, Kain, and Rivkin (2004) raise a cautionary note: the benefits of the competitive process can be undermined because the act of switching schools imposes a disruption cost on movers and those students who are left behind.[13] In addition to the direct costs of mobility on students, the large-scale adoption of a voucher system could have the following effects on the educational system:

- **Composition** Greater competition could adversely affect the composition of the body of students attending particular schools.
- **The teaching profession** The use of vouchers might have a deleterious impact on the performance of teachers.
- **School financing** Vouchers could have an unfavorable effect on the way education is financed in the United States.

Next, we add substance to each of these hypotheses.

Composition: Peer Effects. Composition effects are especially concerning because the efficacy of the learning environment may depend on the quality of a student's peers.[14] Indeed, peer effects raise the frightening prospect of the emergence of a completely stratified—in fact, segregated—educational system, with poor and

under educated inner-city youths stuck in low quality voucher schools and more affluent families paying additional tuition to send their children to first-rate private and charter schools.[15]

This latter possibility exemplifies the possibility of an educational *tipping effect*.[16] To see how it works, consider a given neighborhood that has two similar schools. If each school enrolls similar quality students, then both of them presumably would be equally successful in their subsequent recruitment efforts. Now suppose, instead, that one of the schools has a reputation for attracting better students. What then? Well, if peer quality is important, many parents would attempt to send their child to the better of the two schools. Consequently, the demand for places at the better school would rise and the demand for places at the lower-quality school would fall. Moreover, if the better school selectively admits only the best students, this would further raise its quality and lower the quality of the other school (which, according to the argument just given, has just lost its very best students). Yet, this further raises the demand for placement at the better school! Unimpeded, this process would culminate in the complete stratification of students according to their family backgrounds and innate abilities.

The Teaching Profession. Neal (2002) remarks that, "[S]ome of the most important potential outcomes of adopting vouchers involve likely changes in the labor market for teachers."[17] The labor practices that govern teachers' pay and promotion in the United States are somewhat antiquated. In effect, public schools employ a rigid set of rules in which salaries depend on experience and qualifications. Most important, they often depend neither on a teacher's *performance* nor, for that matter, on his or her *field* of specialization. In contrast, private and charter schools are much more flexible in their personnel policies.[18]

One of the most obvious consequences of the pro-competitive effects of a voucher program is that it forces schools to improve their quality by retaining, cultivating, and attracting proficient teachers. Hoxby (2002) finds that charter schools respond to competitive pressures by adapting their personnel practices. For example, relative to public schools, charter schools demand more qualified teachers, they are more likely to reward teacher effort, and they have a greater propensity to recruit math and science teachers.

As just noted, vouchers can also have troubling consequences for the way schools are financed. These concerns are the subject of the next section.

35.3 Financing Education

In the United States, households pay for publicly provided education through a mixture of federal, state, and local taxes. This, of course, helps to explain the meager size of the private educational sector in the United States. Parents who elect to send their children to private school effectively pay *twice* for their children's

education: they not only pay the private school's tuition but also the taxes that are used to fund public schools. Historically, public schools have received the bulk of their finance from local property taxes.

To better understand the economics of school financing it is helpful to first do a little accounting.[19] Consider a school district within a given city. Model 35.1 lays out the main assumptions about the method of school financing.

MODEL 35.1

School Financing

(a) There are H identical houses and B identical business establishments in the school district. The market value of each house and business is $\$v^h$ and $\$v^b$ respectively.

(b) There are a total of N children who attend public school. The school district spends an equal amount $\$E$ on each child.

(c) The district imposes a (common) property tax, τ, on each household and business. All of the tax revenue collected is spent on the school system.

It follows from Model 35.1 that without any intervention from the state the budget constraint facing the school district is:

$$N{\cdot}E = \tau{\cdot}V \tag{35.1}$$

where $V \equiv (v^h H + v^b B)$ is the total value of the property located in the school district. The left-hand side of Equation 35.1 is total expenditures on schooling, and the right-hand side total tax revenues earmarked for schooling. Simple rearrangement of 35.1 gives:

$$E = (\tau{\cdot}V)/N = \tau{\cdot}\left(v^h\frac{H}{N} + v^b\frac{B}{N}\right) \tag{35.2}$$

For a given level of the tax rate, τ, expenditures per student, E, depend on the property values, v^h, and v^b, and the ratios of households to schoolchildren, H/N, and businesses to schoolchildren, B/N.

This latter observation is important. Although inner cities often have low residential property values (i.e., $\$v^h$ is low), they are populated by a much greater proportion of businesses than the suburbs (i.e., $\$v^b B/N$ is high). This implies that expenditures per student may be greater in the inner cities than in the suburbs—a possibility that often startles the unsuspecting.[20]

Intervention by the State.   Over the past 30 years or so, the states increasingly have played an important role in funding education. One possibility—others are described in Economic Application 35.2—is for the state to provide education dollars according to the perceived needs of the district. Under a progressive system, these needs depend positively on the number of children, N, and *negatively* on

both the local property tax, τ, and property values, V, thus ensuring that wealthier districts tend to receive proportionately fewer state tax dollars.

Let $\$F$ denote the state's target level of expenditure per student, τ_0 the state's view of a reasonable property tax rate, and V the value of the school district's property. A simple financing rule is one in which the state provides each school district an amount per child, $\$S$, that is given by:

$$S = F - (\tau_0 \cdot V)/N \qquad (\textbf{S1})$$

where $(\tau_0 \cdot V)/N$ adjusts the state subsidy according to the school district's wealth. Notice, it is quite conceivable that $S \equiv F - \tau_0 V/N < 0$, implying the local school district disburses tax revenues *to* the state. Finally, let $\$P \equiv E + S$ denote the combined state and local expenditures per student. Equation 35.2 and **S1** imply:

$$P \equiv E + S = F + (\tau - \tau_0)\frac{V}{N} \qquad (\textbf{P})$$

Differences in state and local funding can and do generate wide variations in school funding across alternative school districts.[21] Nonetheless, because of the emphasis on equality that followed *Serrano v. Priest* (see Definition 35.1), state courts increasingly have looked on such disparities very unfavorably. In fact, California's State Supreme Court mandated that the state must implement a fiscally-neutral system, which, in essence, severs the link between school funding and the wealth of the district in question.[22] Moreover, by 1996, state supreme courts had overturned the school funding systems in 16 of the 43 states in which their legitimacy had been challenged.

Murray, Evans, and Schwab (1998) evaluate the effects of the education finance reforms that have occurred in the 30 years that had elapsed since the *Serrano v. Priest* case. Their findings indicate that the reforms reduced inequalities in state spending on education by between 19% and 32%. Most interesting, they find that the gap between spending in rich and poor districts was narrowed by an increase in expenditures in the latter districts, rather than a reduction in the former. Fernandez and Rogerson (1998) analyze the short- and long-run effects of transforming a locally-financed system to a state-financed system that equalizes expenditures per student. In effect, this type of scheme transfers resources from wealthier neighborhoods to poorer ones.

ECONOMIC APPLICATION **35.2**

Educational Financing

In a comprehensive study, Fernandez and Rogerson (2003) compare the performance of 5 different educational finance systems in terms of their efficiency and equity properties. The systems can be understood with the aid of Equations **P** and **S1** above. Thus:

- **Local** Under a local financing system, $F = \tau_0 = 0$. It follows from **P** that the school district's expenditures per pupil are $P = (\tau \cdot V)/N$ (which is the same

as Equation 35.2). Notice that expenditures per student, P, are strongly influenced by the community's wealth, V.

- **State** Under a state financing system, $\tau_0 = \tau = 0$. Using **P**, it follows expenditures per pupil are equalized because $P = F$. This system is the most equitable and is currently used only in California and Hawaii.

- **Foundation** Under a foundation system, $\tau_0 = 0$, which implies from Equation **P** that $P = F + (\tau \cdot V)/N$. In this case, the state guarantees a *minimal* level of funding per student, F. Each school district can, however, top up this amount from local property taxes.

- **Power equalizing** Under a power equalizing scheme, each school district is free to set its own local property tax rate, τ, and hence can raise $\$E = (\tau \cdot V)/N$ in local tax dollars per student. Instead of using the funding mechanism described by Equation **S1**, the state offers *matching funds* on a per student basis of the form:

$$S = \tau \cdot (V_0 - V)/N \qquad (\textbf{S2})$$

Here V_0 is a **common tax base** that is applicable to all school districts in the state. Notice that, under this scheme, less affluent (i.e., low-V) neighborhoods receive additional funds from the state, since $V_0 - V > 0$.

There are two principal forms of the power equalizing scheme that differ according to whether the subsidy from the state, S, can be *negative.*

- **Power equalizing with recapture (PER)** In the case of PER the state subsidy, S, can be *negative*—that is, the district pays any excess tax dollars it collects *to* the state. Using Equation **S2** and the fact $E = (\tau \cdot V)/N$ yields:

$$P \equiv E + S = \tau V_0 \qquad (35.3)$$

Notice that if every school district sets the same local tax, τ, then per pupil expenditures, $\$P$, are equalized across the state. Nevertheless, PER respects the autonomy of school districts by allowing them to set their own tax, τ, and thus how much they will spend on education.

- **Power equalizing without recapture (PNR)** Under a PNR scheme, the subsidy, S, is determined by $S \geq max\{0, \tau(V_0 - V)/N\}$, which implies that the subsidy cannot be negative and as a corollary excess local tax dollars are *not* disbursed back to the state.[23] Notice that in (low-income) neighborhoods, where $S > 0$, $P = \tau V_0$ (as under the PER scheme just described). For a wealthy district, in which $V > V_0$, we have $S = 0$ and so $P = E = (\tau \cdot V)/N$. In this case, per pupil expenditures, P, are the same as under the local financing arrangement first described.

Fernandez and Rogerson (2003) construct a model in which households (optimally) vote on local and state taxes. They demonstrate that differences in

equilibrium outcomes, among the 5 financing schemes just described, are far from cosmetic. Indeed, education spending can differ by as much as 25% across them. The schemes also differ on equity and efficiency grounds. The foundation scheme provides the greatest equity. Yet they show that the PER system consistently provides the greatest level of expected utility. ∎

Chapter 5 shows that capital-market imperfections may result in less wealthy individuals accumulating inefficiently low levels of human capital. Hence a reform of the sort considered by Fernandez and Rogerson (1998)—one that transfers tax dollars from the rich to the poor—could ameliorate the finance constraints faced by the poor and so be efficiency enhancing. Calibrating their model to U.S. data, the authors find that the proposed policy reform increases average incomes, educational expenditures, and overall steady-state welfare levels.

In the 1990s, a number of states imposed strict limitations on the ways in which school districts can levy taxes and spend tax dollars. (For example, Michigan phased out the property tax as a means of school financing.) Proponents of these limitations argue that they reduce inefficiencies in the schooling system and hence provide taxpayers with a better bang for their buck. Figlio (1997) uses data from 49 states to examine these claims empirically. His findings indicated that the tax reforms lowered teachers' (cost of living adjusted) starting salaries by about 10% and increased class sizes by 6.4%. In turn, these changes *reduced* student performance by between 2.4% and 6.7%. Most interesting, schools responded to the imposed fiscal austerity by sometimes increasing the number of administrators on their payrolls!

Mobility and Redistribution

The accounting analysis of school financing just given is all well and fine as far as it goes. Nevertheless, it omits three factors that seem to be critical for a thorough understanding of the issues: property values are endogenous and respond to policy changes, such as changes in property taxes; taxes are endogenous and are determined by a political process; and households choose where they want to live and their choices respond to school quality, neighborhood quality, house prices, and local taxes. Several innovative studies that have appeared have sought to marshal the consequences—for both school financing and school quality—of modeling these more realistic features.

Benabou (1993) explores the link between residential choice, educational investment, and production that occurs in a typical city. Most cities are characterized by a pattern in which high-skill high-wage individuals live in the suburbs and low-skill low-wage individuals reside in the city center. Residential segregation is maintained by substantial differences in equilibrium house prices across districts. Benabou (1993) notes that there is a potentially serious efficiency problem that

could arise from this type of skill-based segregation that results from peer effects. More specifically, if the acquisition of human capital depends on the average ability of one's neighbors, then city stratification could consign entire dynasties of families to live in poorer neighborhoods and to accumulate inefficiently low levels of human capital.[24]

Epple and Romano (1998) examine the effects of school vouchers on the mix between public and private schools. In their model, students differ in their abilities and (parental) income levels. Furthermore, there are peer group effects. Human capital accumulation depends on its own educational efforts and average peer ability in the school. A key finding is that private schools offer tuition breaks (i.e., scholarships) to high-ability low-income students. In essence, a scholarship is a payment *to* the student for a beneficial peer effect: raising the average ability level of the student body. In their model, school vouchers increase the size of the private school sector and benefit high-ability students at the expense of low-ability ones.

Nechyba (2000) constructs a rich model to examine the effects of residential mobility in determining the efficacy of school voucher programs and finds that mobility is indeed a critical issue. Chen and West (2000) compare the performance of categorical vouchers (which are targeted at low-income families) with non-categorical vouchers (which are available to everyone). A noteworthy feature of their analysis is that they assume the total value of vouchers are endogenous and are determined as the outcome of a political process. They show that, in the resulting equilibrium, vouchers tend to be targeted at low-income families.

Much of the mobility literature is predicated on the presence of neighborhood interaction effects. But just how important are these effects in practice? Katz, Kling, and Liebman (2001) use data from a housing mobility experiment, conducted in Boston, in order to evaluate this question empirically.[25] The experiment provided an opportunity (in the form of a housing subsidy) for some low-income families to move from extremely poor neighborhoods to more affluent ones. Families could enroll in the program if they had children and lived in Section 8 housing that was located in a neighborhood in which the poverty level was at least 40%. The program was oversubscribed and successful families were randomly selected via a lottery. The random selection, inherent in the experimental design, allows the authors to assess and isolate the effects of moving to a better neighborhood.[26] Their results indicate that those families who moved to better neighborhoods saw improvements along several dimensions (in particular, better health and a lower incidence of crime). Most interesting, the move had little impact on labor-market outcomes such as earnings and employment.[27] Similar findings are also echoed in an interesting study by Oreopolous (2003) using an expansive Canadian data set that spans a 30-year period. Oreopolous (2003) remarks,

> Despite significant contrasts in living conditions and exposure to crime across projects, neighborhood quality does not make much difference for labor market success in the long run. Unemployment, mean earnings, income and welfare participation rates vary very little between adolescents from different public housing types.[28]

In conclusion, although the preliminary evidence points to the existence of peer effects, they largely appear to be socioeconomic in nature, affecting health status and criminal proclivities rather than labor-market outcomes.

SUMMARY

- In the United States, there are basically three types of school: public, private, and charter. Public schools are run by a local or state board. Private schools are non-government run institutions. In 2003, almost 80% of them (measured by student enrollments) had a religious affiliation. Finally, charter schools are *independent* public schools.

- It is difficult to evaluate the relative performance of public and private schools because of problems of unobserved heterogeneity.

- Both the financing and governance of the school system represent important issues facing policy makers. Financing refers to who foots the bill, and the methods used to raise funds. Governance refers to how schools are run.

- School vouchers are often advocated as a means of improving school quality. The evidence on their efficacy is mixed. Concerns have been expressed that, because of peer effects, a voucher system may adversely affect some communities.

- The problem of determining the *optimal* method of school financing is an extremely complicated one. One of the primary difficulties is that changes in school quality—and in the methods used to finance them—might result in households moving between neighborhoods. As they do so, this will affect (*i*) the tax base and (*ii*) the neighborhood's overall educational quality.

NOTES

1. *A Nation at Risk* (1983, p. 2). The formal title of the report is *The National Commission on Excellence in Education.*

2. Excellent discussions of the major issues discussed in this chapter are provided by Hoxby (1996), Ladd (2002), Neal (2002), and Hanushek (2002).

3. See http://nces.ed.gov/pubsearch for enrollment statistics and for statistics on private-sector education (accessed July 2, 2010).

4. See www.nclb.gov/start/glossary (accessed July 2, 2010).

5. A proclamation by President George W. Bush, during a speech held during National Charter Schools Week (2003). See www.whitehouse .gov/news/releases/2003/04/20030425-2.html.

6. In particular, interest in the charter school system was enhanced by the U.S. Supreme Court's ruling in *Zellman v. Simmons-Harris.*

7. See www2.ed.gov/nclb/accountability/index .html (accessed July 2, 2010).

8. Friedman (1962), p. 85.

9. Friedman also advocated the use of vouchers as a means of easing the financial burden faced by low-income parents.

10. The following discussion draws from the excellent analysis of Neal (2002, pp. 26–32).

11. In contrast, Hoxby (2000) finds that competition from private (or charter) schools positively affects the performance of proximate public schools. Indeed, a noteworthy finding is that private schools attract a disproportionate

number of students who were performing poorly in a public school. This finding should go some way to assuaging the fears of those who criticize expanding the private school sector on the grounds that it will lead to *cream-skimming:* private schools attract the best and the brightest, leaving public schools to cater to the weakest students.

12. Angrist et al. (2002), p. 1556.

13. In fact, the authors find that the mobility leads to substantial reductions in educational attainment levels, which are borne predominantly by low-income minority students, who are precisely the students the voucher program is intended to help.

14. Hanushek, Kain, Markman, and Rivkin (2003, p. 542) find that, "peer average achievement has a highly significant effect on learning across the test score distribution." In contrast, Buddin, Cordes, and Kirby (1998) control for systematic differences between parents who send their children to public and private schools. Their estimates indicate that vouchers would have little effect on school choice in California. Indeed, a voucher for $5,200 would raise the probability that a family attends private school by a modest half a percent.

15. In some states it is illegal for public schools to charge tuition. There are ways, however, of skirting around this prohibition. For example, the school could charge exorbitant fees for extracurricular activities instead.

16. See, for example, Clotfelter (1976). A related issue concerns *white flight*, in which affluent (White) children abandon public schools in favor of private ones in response to an influx of minority students. Fairlie and Resch (2002) uncover evidence of the existence of this process.

17. Neal (2002), p. 32.

18. Hoxby (1996) examines the effects of teachers' unions on the performance of public schools. Her findings are striking. Although unions increase the resources available to public schools, they stymie productivity to such an extent that there is no overall effect on student outcomes.

19. See Hoxby (1996) and Hanushek (2002) for enlightening discussions on these issues.

20. See Hoxby (1996), who shows that this is in fact often the case in practice.

21. Fernandez and Rogerson (1997, p. 24) offer some illustrations. Thus, in 1986, Detroit expenditures were $6,976 per student in Bloomfield Hills; they were only $2,684 in nearby Dearborn.

22. *Beverly Hills 90210* notwithstanding.

23. For the record, $S = max\{0, \tau(V_0 - V)/N\}$ means "equals the greater of either zero or $\tau(V_0 - V)/N$."

24. Bartolome (1990) examines peer group effects in which high-ability students confer positive benefits for low-ability students. His model also includes voting on the provision of a public good (education), migration of individuals between communities, and endogenous variation in house prices. In equilibrium, communities tend to be stratified by ability; moreover, the level of human capital accumulation is inefficient.

25. The data used in Katz, Kling, and Liebman (2001) was obtained from Boston's *Moving to Opportunity* (MTO) experiment. The MTO demonstration (experiment) has operated since 1994 in five cities: Baltimore, Boston, Chicago, Los Angeles, and New York.

26. More specifically, given the random-selection process, lottery *winners* (movers) and *losers* (stayers) must (on average) be very similar populations. It follows that if systematic differences in outcomes are observed between the two populations, then they must be attributable either to the move itself or to neighborhood effects.

27. Ludwig, Duncan, and Hirschfield (2001) use data from Baltimore's MTO program. Their primary concern is evaluating the importance of the neighborhood as a determinant of criminal activity. They discover that movers are less likely to commit violent crimes but somewhat more likely to commit property crimes.

28. Oreopolous (2003), p. 1536.

REFERENCES

Angrist, Joshua D., Eric Bettinger, Erik Bloom, Elizabeth King, and Michael Kremer. (2002). "Vouchers for Private Schooling in Columbia: Evidence from a Randomized Natural Experiment." *American Economic Review* 92(5): 1535–1558.

Bartolome, Charles A. M. de. (1990). "Equilibrium and Inefficiency in a Community Model With Peer Group Effects." *Journal of Political Economy* 98(1): 110–133.

Becker, Gary S. (1962). "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70(5(2)): 9–49.

Benabou, Roland. (1993). "Workings of a City: Location, Education, and Production." *Quarterly Journal of Economics* 108(3): 619–652.

Buddin, Richard J., J. Cordes Joseph, and N. Kirby Sheila. (1998). "School Choice in California: Who Chooses Private Schools." *Journal of Urban Economics* 44(1): 110–134.

Chen, Zhiqi, and G. West Edwin. (2000). "Selective Versus Universal Vouchers: Modelling Median Voter Preferences in Education." *American Economic Review* 90(5): 1520–1534.

Clotfelter, Charles T. (1976). "'Tipping' and Private School Enrollment." *Journal of Human Resources* 22(4): 29–50.

Coleman, James S., Thomas Hoffer, and Sally Kilgore. (1982). *High School Achievement: Public, Private, and Catholic Schools Compared*. New York: Basic Books.

Cullen, Julie B., Brian Jacob, and Steven D. Levitt. (2000). "The Impact of School Choice on Student Outcomes: An Analysis of the Chicago Public Schools." Working Paper 7888. Cambridge, MA: National Bureau of Economic Research.

Epple, Dennis, and Richard E. Romano. (1998). "Competition between Private and Public Schools, Vouchers, and Peer-Group Effects." *American Economic Review* 88(1): 33–62.

Evans, William N., and Robert M. Schwab. (1995). "Finishing High School and Starting College: Do Catholic Schools Make a Difference?" *Quarterly Journal of Economics* 110(3): 941–974.

Fairlie, Robert W., and M. Resch Alexandra. (2002). "Is There 'White Flight' into Private Schools? Evidence From the National Educational Longitudinal Survey." *Review of Economic Statistics* 84(1): 21–33.

Fernandez, Raquel, and Richard Rogerson. (1997). "Keeping People Out: Income Distribution, Zoning, and the Quality of Public Education." *International Economic Review* 38(1): 23–42.

———. (1998). "Public Education and Income Distribution: A Dynamic Quantitative Evaluation of Education-Finance Reform." *American Economic Review* 88(4): 813–833.

———. (2003). "Equity and Resources: An Analysis of Education Finance Systems." *Journal of Political Economy* 111(4): 858–897.

Figlio, David N. (1997). "Did the 'Tax Revolt' Reduce School Performance." *Journal of Public Economics* 65(2): 245–269.

Friedman, Milton. (1962). *Capitalism and Freedom*. Chicago: University of Chicago Press.

Hanushek, Eric A. (2002). "Publicly Provided Education." In *Handbook of Public Economics*. Vol. 4. Ed. Alan J. Auerbach and Martin Feldstein. Amsterdam, North Holland: Elsevier, pp. 2047–2143.

Hanushek, Eric A., John F. Kain, Jacob M. Markman, and Steven G. Rivkin. (2003). "Does Peer Ability Affect Student Achievement?" *Journal of Applied Econometrics* 18(5): 527–544.

Hanushek, Eric A., John F. Kain, and Steven G. Rivkin. (2004). "Disruption Versus Tiebout Improvement: The Costs and Benefits of Switching Schools." *Journal of Public Economics* 88(9–10): 1721–1746.

Howell, William, and Paul Peterson. (2002). *The Education Gap*. Washington, DC: Brookings Institute.

Hoxby, Caroline M. (1996). "Are Efficiency and Equity in School Finance Substitutes or Complements?" *Journal of Economic Perspectives* 10(4): 51–72.

———. (1996). "How Teachers' Unions Affect Education Production." *Quarterly Journal of Economics* 111(3): 671–718.

———. (2000). "Does Competition Among Public Schools Benefit Students and Taxpayers?" *American Economic Review* 90(5): 1209–1238.

———. (2002). "Would School Choice Change the Teaching Profession?" *Journal of Human Resources* 38(4): 846–891.

Katz, Lawrence F., Jeffrey R. Kling, and Jeffrey B. Liebman. (2001). "Moving to Opportunity in Boston: Early Results of a Randomized Mobility Experiment." *Quarterly Journal of Economics* 116(2): 607–654.

Krueger, Alan B., and Pei Zhu. (2003). "Another Look at the New York City School Voucher Experiment." *American Behavioral Scientist* 47: 658–698.

Ladd, Helen F. (2002). "School Vouchers: A Critical View." *Journal of Economic Perspectives* 16(4): 3–24.

Ludwig, Jens, Greg J. Duncan, and Paul Hirschfield. (2001). "Urban Poverty and Juvenile Crime: Evidence from a Randomized Housing-Mobility Experiment." *Quarterly Journal of Economics* 116(2): 655–679.

McEwan, Patrick J., and Martin Carnoy. (2000). "The Effectiveness and Efficiency of Private Schools in Chile's Voucher System." *Educational Evaluation and Policy Analysis* 22(3): 213–239.

Murray, Brian C., William N. Evans, and Robert M. Schwab. (1998). "Education-Finance Reform and the Distribution of Education Resources." *American Economic Review* 88(4): 789–812.

National Commission on Excellence in Education. (1983). "*A Nation at Risk:* The Imperative for Educational Reform." Policy Report. Washington, DC: U.S. Department of Education.

Neal, Derek. (1997). "The Effects of Catholic Secondary Schooling on Educational Achievement." *Journal of Labor Economics* 15(1): 98–123.

———. (2002). "How Vouchers Could Change the Market for Education." *Journal of Economic Perspectives* 16(4): 25–44.

Nechyba, Thomas. (2000). "Mobility, Targeting, and Private School Vouchers." *American Economic Review* 90(1): 130–146.

Oreopolous, Philip. (2003). "The Long-Run Consequences of Living in a Poor Neighborhood." *Quarterly Journal of Economics* 118(4): 1533–1575.

Rouse, Cecilia E. (1998). "Private School Vouchers and Student Achievement: An Evaluation of the Milwaukee Parental Choice Program." *Quarterly Journal of Economics* 113(2): 553–602.

Sander, William. (1996). "Catholic Grade Schools and Academic Achievement." *Journal of Human Resources* 31(3): 540–548.

———. (1999). "Private Schools and Public School Achievement." *Journal of Human Resources* 34(4): 697–709.

Witte, John. (1999). *The Market Approach to Education: An Analysis of America's First Voucher Program.* Princeton, NJ: Princeton University Press.