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Education, Land, and Location

Edited by Gregory K. Ingram and Daphne A. Kenyon

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PREFACE

This volume, which is based on the annual land policy conference held in Cambridge, Massachusetts, in June 2013, addresses the links between education, land, and location. This is the eighth in a series of volumes that derive from the Institute's signature annual land policy conference. Over the years, these events have addressed land policy as it relates to a range of topics including fiscal decentralization, property rights, municipal revenues, climate change, value capture, and infrastructure.

One fundamental link between education, land, and location occurs because children usually attend elementary and secondary schools near their homes, while families base their location decisions in part on the quality and location of K–12 schools. We were interested in exploring how these links were changing due to the growing importance of school choice and the rise of new forms of schooling. Going into the conference, we hypothesized that transportation to school might be the "banana peel on the doorstep of school choice" that constrains the feasible options for students and limits the ability of school choice to improve education quality.

Although we did find that transportation was an important limiting factor, the conference and resulting volume also clarified several other links between education, land, and location. For example, parent preferences for sending children to nearby schools also limit the potential benefits of expanding school choice because only those few schools close to home will be considered as viable options even if dozens of schools are potential options. We were surprised by the growth of homeschooling (along with the absence of data on its effects on student achievement) and fascinated by the variety of charter schools. We were intrigued by the finding that charter schools are likely to offer a superior educational climate for high-poverty students but not for low-poverty students.

In addition to the authors and conference participants, many others have contributed to the design of the conference and the production of this volume. Karin L. Brandt was instrumental in organizing the conference and inviting speakers. Helen Haas gracefully managed conference and publication logistics during a time of staff transition. We thank Armando Carbonell, Martim Smolka, and Joan Youngman for their advice on the selection of topics and on program design. Samuel Moody made significant contributions in a wide range of ways, including helping to manage the conference, conducting background research for the introductory chapter, corresponding with authors and discussants, reading and editing papers, and organizing documents and e-mails. Bethany P. Paquin helped with background research for the introductory chapter. The conference would not have been possible without the logistical support of our conference

event team, comprising Brooke Burgess, Sharon Novick, Cindy Moriarty, and Melissa Abraham. Our special thanks go to Emily McKeigue for her overall management of the production of this volume, to Vern Associates for the cover design, and to Nancy Benjamin and Barbara Jatkola for their tireless and reliable copyediting.

Gregory K. Ingram
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Introduction to Education, Land, and Location

Gregory K. Ingram and Daphne A. Kenyon

Because most children throughout the world attend elementary and secondary schools near their homes, where children live usually determines where they go to school. In the United States, the relationship between residential location and education has been especially strong given the dominance of local funding and local control of K–12 education. For most families, the decision to purchase a home carries with it the option to send their children to a particular school. School quality varies markedly among the more than 14,000 school districts across the United States and within many of the country's large urban districts. Housing prices reflect school quality, so that otherwise similar houses in better school districts or more advantaged neighborhoods of large districts sell at a premium. In other words, school quality is capitalized into the price of land. This summarizes the manner in which elementary and secondary education is tied to both location and land.

The chapters in this volume explore the links between education, location, and land and originated as papers presented at the 8th Annual Land Policy Conference of the Lincoln Institute of Land Policy. Three policy outcomes are the focus of this volume: academic achievement of schoolchildren; racial, ethnic, and socioeconomic segregation; and equality of opportunity. The issues explored here have broad relevance to U.S. public policy. Public concern about the quality of

The authors wish to thank Sam Moody and Bethany Paquin for their very helpful research assistance, Andrew Reschovsky and Joan Youngman for their thoughtful comments on previous drafts, and Elizabeth Kachavos for her editing suggestions.

education has been high at least since the 1983 publication of *A Nation at Risk: The Imperative for Educational Reform*, a report by the National Commission on Excellence in Education. In recent years, a robust debate has arisen concerning school quality and growing income inequality. The 50th anniversary of Martin Luther King Jr.'s "I Have a Dream" speech, the election of America's first black president, and the growing diversity of the population have reinvigorated public discourse about educational opportunity and racial and ethnic inequality.

This volume is particularly timely in light of the rise and increasing predominance of school choice options, which have the potential to break the link between education and location and land. This introduction sets the stage for the chapters that follow by presenting important background information on the book's three policy themes, as well as on the nature of the education-location link in traditional public education, the rise of school choice, and the impact of education on housing markets.

The Education-Location Link in Public Education

One way to view the education-location link in traditional public education, or in a system of public education with multiple school districts in which students are assigned to their neighborhood public schools, is through the lens of the Tiebout model (Tiebout 1956).[1] The essence of the model is that mobile households choose among a variety of local jurisdictions in order to obtain the "package" of government services and taxes that makes them happiest. For example, one family with school-age children might choose a town with good schools but higher taxes, whereas a two-person household with no children might choose a town with lower taxes and lower-quality schools but a good library and extensive recreational programs. Households sort themselves into communities based on their preferences for government services and taxes.

Multiple local governments, by offering different tax and public service combinations, in competition with each other, make the public sector more like the private sector and contribute to a public sector that better satisfies household preferences than a monolithic government would. Indeed, Charles Tiebout proposed his model as a partial solution to the problem in public finance that "no 'market type' solution exists to determine the level of expenditures on public goods" (Tiebout 1956, 416). He was searching for a model that would force a household to reveal its preferences for public services so that government could satisfy its preferences "in the same sense that a private goods market does" (418) and tax the household accordingly. According to Tiebout, "The act of moving or

1. Charles Tiebout's article has inspired a voluminous literature. These paragraphs can give only the briefest summary of the model, but see Fischel (2006).

failing to move is crucial. Moving or failing to move replaces the usual market test of willingness to buy a good and reveals the consumer-voter's demand for public goods" (421).

More-complex versions of the model include zoning as an integral part. Zoning and other land use controls can limit the amount of multifamily housing in a town or require that single-family homes be built on a minimum lot size. This requires a new entrant into the community to pay at least a certain amount of property taxes. Zoning prevents poorer households from moving into rich jurisdictions with better government services without paying as much for those services as the rich households do (Hamilton 1975).

As Wallace Oates notes in his review of the Tiebout literature, "Many observers, however, find themselves uncomfortable in a Tiebout world. While it is true that it promotes efficient resource use through the stratification of communities by demands for local services, this very stratification has some unappealing distributional consequences." In particular, Oates notes that the resulting "high-income communities with excellent schools juxtaposed to poorer school districts with inferior school systems" is in direct conflict with the cherished principle of equality of opportunity (Oates 2006, 41).

The Tiebout model is more applicable in some parts of the country than in others because some states and urban areas have many more school districts than others. For example, the state of Hawaii has a single school district, and the Tiebout model would not apply. In contrast, Vermont has a very fragmented system of local school districts and provides households with many schooling choices. On average, in the United States each district has just over 3,500 pupils, but the range is impressive. Hawaii's single school district serves 179,000 students, whereas fragmented Vermont's 291 school districts serve an average of 327 students each. An additional consideration when applying the Tiebout model is the degree to which school funding is local. As Andrew Reschovsky details in chapter 6 of this volume, some states rely much more heavily on local property taxation, the predominant form of local funding, than other states.

Related to the Tiebout model is William Fischel's (2001) "homevoter hypothesis." According to Fischel (2006, 7), "Ownership of a home in a well-run community is an important goal for most Americans, and home equity is the chief form of savings for the great majority." All homeowners, whether they have school-age children or not, have an incentive to carefully evaluate local school spending proposals and support only those that are likely to enhance school quality at a reasonable cost. Because higher taxes are negatively capitalized into property values, while higher-quality schools are positively capitalized into property values, all homeowners have an incentive to be engaged as stewards of local government.

There is also an education-location link within some large school districts. Large school districts with multiple schools create school attendance zones, also called catchment zones. Unless there is a system of school choice, students are assigned to attend schools in the attendance zones where they live. Researchers

have found that there are large inequities in educational spending across school attendance zones within some of these large districts (Guin et al. 2007).

Racial, Ethnic, and Socioeconomic Segregation

Within the decentralized system of local government in the United States, locational choice decisions by households have produced a great deal of racial, ethnic, and socioeconomic stratification, or segregation.[2] On one hand, residential segregation of blacks and whites, which peaked between 1950 and 1970, has been declining steadily since then. The index of dissimilarity, one of the standard measures of segregation long used by sociologists, ranges from 0 to 100 and can be interpreted as the proportion of individuals of either group that would have to change neighborhoods in order for the two groups to be found in equal proportions in all neighborhoods. The average dissimilarity index of major U.S. metropolitan areas measuring black-nonblack segregation was over 70 percent from 1950 to 1970, when it began falling, reaching 43 percent by 2010.[3]

On the other hand, a great deal of segregation remains. For example, the average white (non-Hispanic) person lives in a neighborhood that is about 75 percent white, 7 percent black, and 18 percent Hispanic, Asian, or other, whereas the average black person lives in a neighborhood that is about 35 percent white, 45 percent black, and 20 percent Hispanic, Asian, or other (Logan and Stults 2011). This pattern is illustrated for four main ethnic groups in figure 1.1.

While segregation by neighborhood and segregation by school are not in lockstep with each other, in practice they are closely connected. Logan (2002, 3) notes that the "average white child attends a school that is over 78% white. Only 9% of other children in this typical school are black, 8% Hispanic, and 3% Asian."

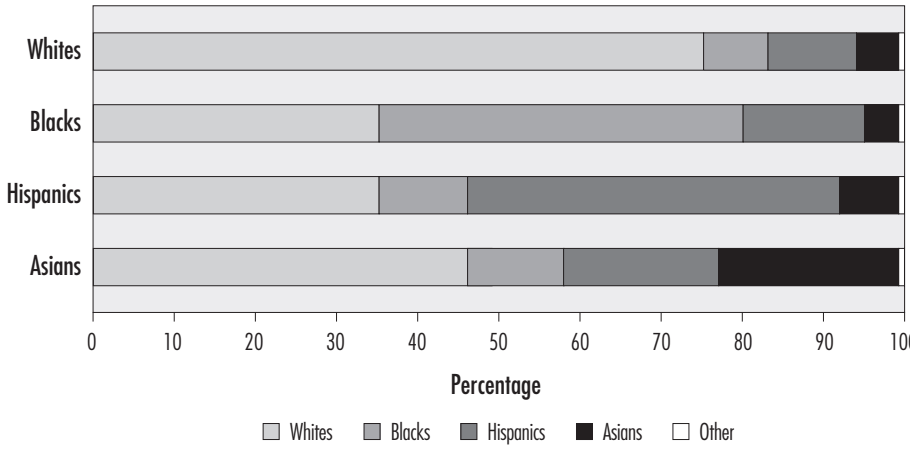
Although some reports still focus on black-white segregation, it is important to recognize the increasing ethnic diversity of the U.S. population and the changing nature of residential segregation. Currently, non-Hispanic whites make up 67 percent of the U.S. population, but the nation's Hispanic population exceeds its black population. Demographers now predict that "non-Hispanic whites will be a minority of the child population before 2020" (Logan and Stults 2011, 2).

One way the nature of segregation is changing is in the growth of increasingly diverse but all-minority neighborhoods. Another important development

2. For an overview of various government policies that have contributed to racial segregation, see Rothstein (2013).

3. Calculated from data in Cutler, Glaeser, and Vigdor (1999) and Glaeser and Vigdor (2012).

Figure 1.1
Diversity Experienced in Each Group's Typical Neighborhood, National Metropolitan Average, 2010



Source: Reprinted with permission from Logan and Stults (2011).

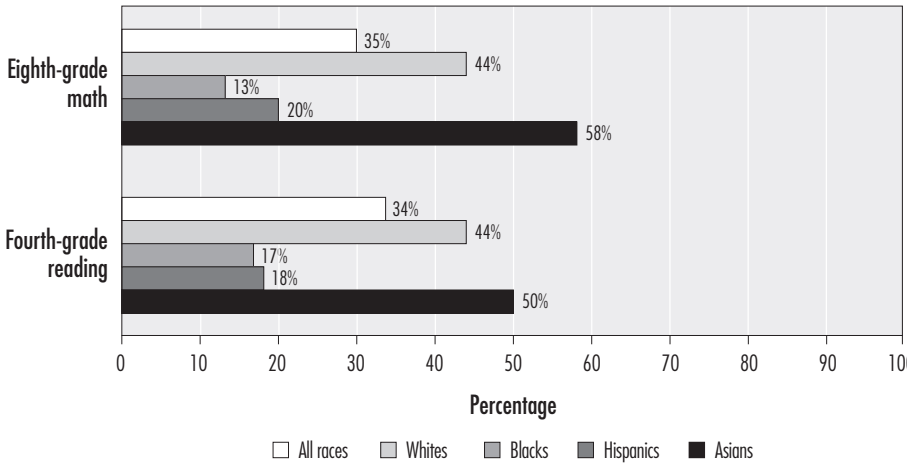
has been increasing socioeconomic segregation. Wealthy households have become increasingly segregated from low-income households, as a comparison of the 2010 census to the 1980 census shows (Reardon and Bischoff 2011).

Academic Achievement Gaps

As researchers Sean Reardon and Joseph Robinson (2008, 497) note, "Racial, ethnic, and socioeconomic disparities in academic achievement remain a stubborn fact of schooling in the United States." One commonly cited measure of educational performance is scores on the National Assessment of Educational Progress (NAEP), widely known as the "nation's report card." In 2002, the No Child Left Behind Act (NCLB) mandated that every state participate in this test, which had previously been voluntary. Figure 1.2 reports the percentage of students scoring at or above proficient in eighth-grade math and fourth-grade reading in 2011 for all races, as well as for whites, blacks, Hispanics, and Asians. While 50 percent of Asian students and 44 percent of white students scored at or above proficient in fourth-grade reading, only 18 percent of Hispanic students and 17 percent of black students scored as high.

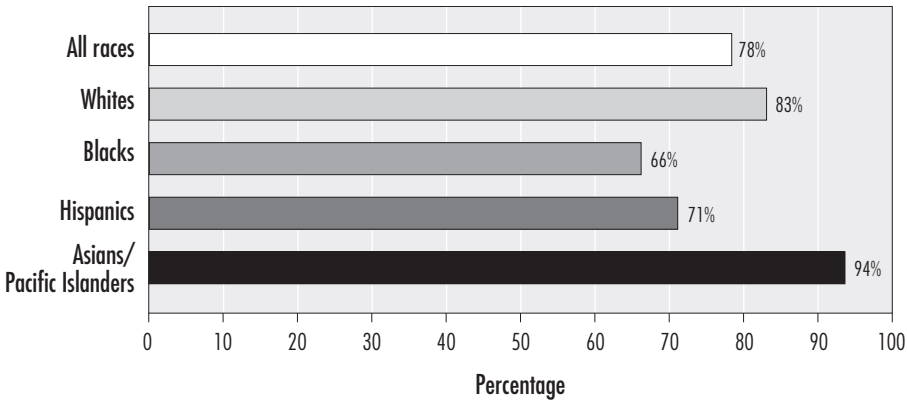
An alternative widely used measure of academic achievement is the high school graduation rate. Figure 1.3 shows that the 2010 high school graduation

Figure 1.2
National Assessment of Educational Progress (NAEP) Achievement Levels by Race, 2011 (percentage of students scoring at or above proficient)



Source: National Center for Education Statistics (n.d.).

Figure 1.3
Public High School Freshman Graduation Rates by Race, 2010



Source: National Center for Education Statistics (2013).

rate was highest for Asian/Pacific Islander students, followed by white students, Hispanic students, and black students.[4]

In recent years, overall academic achievement gaps between whites and both blacks and Hispanics have narrowed significantly when measured by NAEP scores or graduation rates. However, as Eric Hanushek describes in chapter 2 of this volume, college completion rates for whites and both blacks and Hispanics have "significantly diverged."

Recent research has found that achievement gaps between high- and low-income families have grown over the past 25 years and are now larger than the black-white achievement gap (Reardon 2011). There are also "growing gaps between children from high- and low-income families in college entry, persistence and graduation" (Bailey and Dynarski 2011, 117). A further cause for concern is that low test scores and high dropout rates are concentrated in urban schools, which enroll a high proportion of black and Hispanic students (Murnane 2013).

Equality of Opportunity

Eric Hanushek's lead chapter in this volume examines "how location interacts with schooling opportunity," and his title asks, "Is location fate?" In chapter 12, Elizabeth J. Mueller and Shannon S. Van Zandt state, "Opportunities, in the form of good schools and other public services . . . are neither evenly distributed across regions nor accessible to all."

A new study of intergenerational income mobility called the Equality of Opportunity Project provides extensive data on how economic opportunity varies among metropolitan areas across the United States. Raj Chetty and colleagues (2013) compiled millions of earnings records to measure intergenerational mobility for children born in 1980 or 1981 for 741 commuting zones (similar to metropolitan areas) across the United States. They found substantial differences in economic mobility among these zones. Mobility is generally less in the Southeast and industrial Midwest, with Atlanta exhibiting the lowest economic mobility rates and Detroit close to the lowest. The highest economic mobility rates tend to occur in the Northeast, Great Plains, and West, with Manchester, New Hampshire; Boston; New York City; San Francisco; and San Diego among the 10 large cities with the highest economic mobility (Chetty et al. 2013; Leonhardt 2013).

Although Chetty and his colleagues caution that they have not yet determined the causes of differing economic mobility rates, they present some interesting

4. Richard Murnane (2013) reports high school completion rates, which omit students who have received a General Educational Development (GED) credential and students who have recently immigrated to the United States. He found that for 2010, white youths ages 20–24 had an 86 percent high school completion rate, while black and Hispanic youths each had 78 percent completion rates.

correlations. Of particular relevance for this volume are their findings that areas with greater economic and residential segregation also had lower economic mobility and areas with higher school quality (as measured by test scores and high school dropout rates) had higher rates of economic mobility.[5]

The Rise of School Choice

Fifty years ago, school choice in the United States was limited. For those with sufficient resources or a commitment to religious education, private schools (including parochial schools) were always an option. Since the 1960s, several additional forms of school choice have been introduced. School choice options now include the following:

- Magnet schools and programs, which often have a special focus, such as mathematics or fine arts, and which were conceived to reduce segregation by drawing students from racially or ethnically concentrated communities.
- Homeschooling, which is the practice of educating school-age children at home, usually by a parent, instead of at a public or private school.
- Interdistrict choice policies, which allow parents to transfer a child from the child's assigned public school to another public school outside the assigned district.
- Intradistrict choice policies, which allow parents to transfer a child from the child's assigned public school to another public school within the assigned district.
- School choice vouchers, which provide public funding for private school tuition.
- Charter schools, which are public schools that are independently governed according to a charter agreement with the state allowing these schools greater autonomy and flexibility than traditional public schools.

These school choice options were introduced from the late 1960s to the early 1990s, as shown in table 1.1. Any of these forms of school choice have the potential to separate education from location. Consider two examples. First, suppose a family chooses a charter school for a child's education. Depending on charter school availability and transportation constraints, the child might live quite a distance from his or her school. Second, consider homeschooling or a virtual charter school. In this case, the family's location is essentially unlinked from the child's schooling.

5. This volume does not examine the inequality of opportunity that results from the fact that K–12 education is primarily funded by the property tax and the wave of school finance litigation that has sought to address that, but for a review of this history, see Kenyon (2012).

Table 1.1
School Choice Options Developed in the Past Few Decades

Options	Date of Origin or Major Expansion
Magnet schools and programs	1968
Homeschooling	Late 1960s/early 1970s[a]
Interdistrict and intradistrict choice	1980s (voluntary) 1991 (mandatory)
School choice vouchers	1989
Charter schools	1991 (legislation) 1992 (first school)

[a]Scholars point to the 1960s and early 1970s as the beginning of the modern homeschool movement. Homeschooling was common in the United States up until the mid-1800s but waned with the rise of compulsory education. Some states outlawed homeschooling, but by 1993 all 50 states permitted the practice.
Sources: Gaither (2009); Lavery and Carlson (2012); Minnesota Legislative Reference Library (n.d.); National Conference of State Legislatures (n.d.); Reich (2002); Sergienko (2005).

Table 1.2
K–12 Enrollment Rate Estimates by School Type, 1999 and 2010

School Type	1999 Enrollment Rate (%)	2010 Enrollment Rate (%)
All school choice options	25.2[a]	28.7
Private school	9.8	9.5
Charter school	0.6	3.1
Homeschool	1.6	3.6
Interdistrict or intradistrict choice	13.2[a]	8.8
Magnet school or program		3.6
Assigned public school	74.8	71.3

[a]Although no data are available on magnet or inter- and intradistrict choice enrollment in 1999, we know that 13.8 percent of students in grades 1–12 attended a "chosen public school" (charter school, magnet school or program, or inter- or intradistrict choice), so approximately 13.2 percent of students attended either a magnet school or a nonassigned inter- or intradistrict public school. Combined with homeschooled students, charter school students, and students attending private schools, 25.2 percent of students took advantage of a school choice option.
Sources: Calculations based on National Center for Education Statistics (2012, 2013, various years); Ray (2011).

In the 1960s, private schools, magnet schools, and homeschooling were the only available alternatives to an assigned public school, and approximately one in ten children chose these options. Now families have many more school choice options, and available data indicate that between one-quarter and one-third of schoolchildren use a school choice option (table 1.2). The quantitatively most

important forms of school choice are interdistrict and intradistrict choice. Given that the No Child Left Behind Act mandates intradistrict or interdistrict school choice options for certain schools failing to meet adequate yearly progress goals, these forms of school choice are likely to remain highly important (U.S. Department of Education 2009).

School choice has also grown internationally over the past few decades (Musset 2012), but it is beyond the scope of this volume to provide an international overview of school choice options. Chapters 11 and 13, however, explore school choice in England and Chile, respectively.

The Education and Housing Markets

Since 1969, scholars have examined the impact of schools on home values (Oates 1969). Many studies have examined whether homes in areas with high-quality schools are priced higher than identical homes in areas with lower-quality schools. Phuong Nguyen-Hoang and John Yinger (2011) reviewed 50 such studies published since 1999. Although the studies used different data sets and methodologies, their results are broadly consistent. Nguyen-Hoang and Yinger conclude that a one-standard-deviation increase in student test scores increases house prices by between 1 and 4 percent, all else being equal. No U.S.-based study has found evidence that value-added measures of performance (measures of how much schools or teachers contribute to student learning) are capitalized into house values.[6]

A related line of inquiry is whether unlinking residential location and schooling, through the introduction of some sort of school choice, will have a significant impact on the housing market. Nechyba (2003) examined this question with a general equilibrium model that predicted that the introduction of school vouchers would create an incentive for high- and middle-income families to move to less affluent districts in order to take advantage of lower house prices. As a result, house prices in districts with low school quality rose, and house prices in districts with high school quality fell. Furthermore, in the model, residential segregation declined.

Summary of Chapters

The chapters in this volume are grouped into four sections: assessment of the literature, school district organization and finance, effects of school location, and unlinking education and location. Unless otherwise noted, the quotations in each section are taken from the chapter being discussed. The volume has an explicit interdisciplinary focus, with contributors from the fields of economics, educa-

6. For a short overview of the promises and challenges of measuring value added in education, see Harris (n.d.).

tion, sociology, and planning. Several of the chapters, including those in the first section, are literature reviews or interpretative essays. Others contribute new empirical work or present case studies.

ASSESSMENT OF THE LITERATURE

Eric A. Hanushek begins by considering the impact of human capital on economic outcomes, arguing that cognitive skills are a better measure of human capital than years of schooling. He focuses on urban schools because large urban school districts account for a disproportionate number of students, particularly black and Hispanic students. Hanushek notes that while differences in high school attainment rates and scores on NAEP among whites, blacks, and Hispanics have converged somewhat, the "gaps in achievement are truly stunning."

Based on his literature review, he concludes that the average black worker suffers a 13 percent loss of income each year of his or her work life due to the black-white achievement gap, while the average Hispanic worker suffers a 10 percent loss. Hanushek was also able to estimate the impact of eliminating these achievement gaps on U.S. economic growth. If the United States were to pursue policies that raised the cognitive skills of black and Hispanic students to the level of white non-Hispanic students, average GDP would increase by about 7 percent. As he notes, this is an enormous return to investment in education.

Hanushek goes on to examine what the current literature says about the causes of achievement gaps. He discusses racial concentrations, teacher quality, and early childhood education as potential determinants of educational achievement and concludes, "Perhaps the strongest and most consistent finding of recent research is the importance of teacher quality in student achievement."

His chapter ends with an assessment of various ways to address achievement gaps, although he is not optimistic about any of the policy alternatives, including expanded school choice through charter schools. Charter schools can provide options for low-income families whose alternatives were previously limited to either residential relocation or private schools. However, research to date has found that charter schools have an uncertain impact on student performance. The best empirical studies have found "a small average difference in achievement growth between charter schools and their corresponding traditional public schools, with large numbers of both very good and very bad charter schools."

Eric J. Brunner reviews two areas of research concerning the link between residential location and school quality: (1) the long-standing and growing literature on the effects of a residentially based assignment system that rations access to high-quality schools through the housing market; and (2) the relatively new literature on the impact of school choice on that system.

His analysis supports three major conclusions. First, under a residentially based school assignment system, residential location decisions lead to communities that are racially and economically stratified, with greater stratification in metropolitan areas with more numerous school districts. Second, attempts to equalize educational opportunities through court orders or legislation have been

only partially successful, because residential location decisions can to a certain degree undo the effects of the reforms. Finally, school choice to some extent unlinks residential location and school quality, and the small theoretical and empirical literatures both support the idea that school choice has the potential to significantly reduce income disparities across communities.

Ellen B. Goldring and Walker Swain contribute a complementary view of the link between residential location and schooling. Their chapter is divided into three loosely chronological sections that focus in turn on residential location–schooling linkages, policies such as court-mandated busing and school choice that reduce the link between residential location and schooling, and the relinking of residential location and schooling. Compared to Brunner, Goldring and Swain focus more on changing government policies and the impacts on academic achievement.

Their chapter also adds important nuance to the volume's discussion of the link between residential location and schooling. The authors note that transportation costs and parents' interest in placing their children in nearby schools with particular racial and ethnic mixes limit the impact school choice policies can have in unlinking residential choice from schooling. They also note that balancing sometimes mutually conflicting positive goals is one of the challenges in choosing the best public policies. For example, although research has shown that segregated schools have detrimental impacts on academic achievement for blacks, using coercive policies to reduce segregation can erode community engagement.

SCHOOL DISTRICT ORGANIZATION AND FINANCE

The second part of the volume includes chapters with important background on the system of public education in the United States, focusing on the structure of school districts, how public education is financed, and how children are transported to school.

William A. Fischel's chapter "Not by the Hand of Horace Mann: How the Quest for Land Value Created the American School System" is an economic history of K–12 education and the structure of school districts. As the second part of the title suggests, Fischel argues that land or property values have been a motivating force throughout the history of American education, beginning with the Land Ordinance of 1785, which established school section endowments for public land sold by the national government. The first part of the title refers to the decentralized system of local control of public education that is one of the unique features of K–12 education in the United States. (Horace Mann, the first superintendent of schools in Massachusetts, argued in favor of centralization and against local school district autonomy.) Among other points, Fischel asserts that school district boundaries were not decided by state policy makers, but rather by "the same thing that motivates modern support for education by the majority of voters who have no children in public schools: land values."

Two additional themes of his chapter are the changing technology of education and the diversity in school district structure across the United States.

Fischel's description of the tutorial-recitation method of instruction common in one-room schoolhouses and the transition to the multiclassroom age-graded education that followed provides a useful context for considering today's changing technology, such as flipped classrooms and virtual schools.[7] Fischel shows that the South and arid West have many fewer school districts per land area than much of the rest of the country. For example, a single school district serves the entire Las Vegas urbanized area, while the top four school districts in Boston serve less than 9 percent of the urbanized area. Thus, the school district structure around Boston is more competitive than the structure around Las Vegas, thereby offering parents more school choices apart from the mechanisms typically labeled as school choice options.

Andrew Reschovsky examines the role of the property tax in funding K–12 education. At present, local and state governments each contribute a national average of 44 percent of funds spent on public education, with the federal government contributing 13 percent. The bulk of the funding raised by local governments is derived from the property tax. Currently, about 35 percent of total public school funding is derived from property taxes, and this percentage has been remarkably stable since 1977. But as Fischel also notes, the degree of property tax reliance varies considerably among states, with several, such as Connecticut, deriving more than 50 percent of total public school funding from the property tax, and a few, such as Alabama, deriving less than 15 percent from this tax.

Reschovsky is pessimistic about the prospects for future federal and state funding of K–12 education. The federal government has a high debt burden, faces rising costs of entitlement programs, and has an aversion to raising taxes. State governments face the same antitax environment, while their ability to fund education aid is limited by revenue sources that fail to keep up with economic growth, and they face pressures to increase spending on health care and pensions. Reschovsky concludes that funding public education at an adequate level will likely require a continued and possibly enhanced role for the property tax, a substantial challenge given demographic changes such as the rising proportion of the population that is elderly and pervasive antipathy toward the property tax.

Given Reschovsky's pessimistic view of the revenue outlook for school districts, Henry A. Coleman's chapter "Nontraditional Public School Funding Sources: Trends, Issues, and Outlook" serves as a very useful sequel. Coleman examines a wide range of nontraditional revenue sources, including local-option personal income and general sales taxes, user charges and fees, gaming revenues, private donations, charter schools (which obtain greater private contributions than traditional public schools and may have lower costs), and tax expenditures.

7. "Flipped classrooms" is an educational technique in which student viewing of lecture videos replaces traditional homework and class time is used for one-on-one interaction between students and teachers and other activities.

Coleman reviews the literature on these revenue sources, examines key issues with an emphasis on equity, and speculates about the potential for future use.

Coleman concludes that no single nontraditional revenue source will play an important role in school funding. He asserts that fees and charges, along with tax expenditures, are the nontraditional revenue sources most likely to grow in importance. On the whole, Coleman believes that nontraditional revenue sources are less revenue productive, less stable, and probably less equitable than the local property tax. For these reasons, he urges state and local governments to loosen some of the constraints on property taxes, such as tax and expenditure limits, in order for the property tax to serve as a more effective source of funding for K–12 education.

Kevin J. Krizek, Elizabeth Wilson, Julian Marshall, and Ryan Wilson examine the role that transport costs play in school choice. They note that the average per pupil cost for transportation among U.S. school districts was $570 in 2010 (about 5 percent of the average total per pupil expenditure). Their chapter reviews the literature on the transport costs of school choice and then presents a detailed case study of St. Paul, Minnesota, that involves both a parent survey and a modeling application.

St. Paul, Minnesota, has a population of about 300,000 and covers 56 square miles. In 1974, nearly all students walked or bicycled to their neighborhood schools. Since then, a system of magnet schools has been established, so that of 55 elementary schools, 34 are now designated as magnet schools. By 2005, 67 percent of students attended a school outside their neighborhoods. The results of the parent survey show that compared to students from neighborhood schools, school choice students walk two-thirds less, are driven one-quarter less, and use school buses twice as much. The authors estimated the costs of transportation under the current policy compared to three other scenarios, including one in which students attend only neighborhood schools. They found that transport costs under St. Paul's current policy are more than seven times greater than the neighborhood-only scenario, but they caution the reader against applying this estimate to other school districts across the country.

EFFECTS OF SCHOOL LOCATION

The third part of the volume contains three chapters that examine the effects of school location on students and households, focusing on charter schools in the United States and their near equivalent in England, academy schools.

Charter schools are just one school choice option, but one of the options that is growing rapidly. Robert Bifulco contributes a thorough review of the literature on charter school location, pointing out areas where more research would be useful. He also provides information from the Common Core of Data (2009–2010) on the location of charter schools across the United States. He concludes that charter schools tend to locate in large cities and in districts with a higher percentage of low-income and black students, particularly in the Northeast and Midwest

and in most of the South. Also, in a majority of the states with charter schools, charters tend to locate in disadvantaged neighborhoods. Importantly, he found no evidence that charter schools systematically avoid the most disadvantaged children or seek out the most advantaged neighborhoods.

Charter school location depends on both demand factors and supply factors. Demand factors are important, as parents tend to prefer to send their children to schools close to home. Supply factors include costs, financing policies, accountability policies, political realities, and authorizer behavior. Policy makers are likely to have multiple, possibly conflicting goals for charter schools that involve impacts on school segregation, fiscal impacts on public school districts, school competition, and housing markets. Policy makers could potentially tweak some of the supply factors to better achieve their primary policy goals.

John R. Logan, Julia Burdick-Will, and Elisabeta Minca contribute a complementary analysis of charter schools across the United States. Their sample included only districts with at least one noncharter and one charter school. They used fourth-grade test scores and other data about public elementary schools from the National Center for Education Statistics (NCES) to examine three questions:

1. Can one characterize the various types of charter schools in the United States?
2. What impact do charter schools have on segregation?
3. Do test scores in charter or noncharter schools indicate a more favorable geography of opportunity for children of different racial and ethnic groups?

The authors used exploratory latent class analysis to divide the charter schools into seven groups, which vary markedly. One group, which includes the most districts, schools, and students, is highly urban, has the highest percentage of Hispanic students, and has a large share of black and Asian students. This group contrasts with two other groups, one of which includes predominantly suburban schools with a majority of white students and the other a small percentage of low-income students. The authors' examination of the impact of charters on segregation shows that black students appear to attend more racially isolated schools, but the quantitative impact of this effect on overall district segregation is small. Finally, the authors report surprising results regarding their last question about test scores. Among low-poverty schools, noncharters have higher test scores than charters, but among high-poverty schools, charters have higher test scores. Given that black and Hispanic students are disproportionately located in high-poverty schools, it appears that moving to charter schools may offer them a superior educational climate.

England has had various forms of school choice for decades. Stephen Machin and Anne West focus on the introduction of academy schools, a new form of

secondary school, in 2000. Academies are broadly similar to charter schools in the United States in that they are independently run public schools that are subject to a different regulatory framework from other public schools. By 2008–2009, 4 percent of secondary schools in England were academies. (In comparison, about 3 percent of K–12 students now attend charter schools in the United States.)

The empirical work conducted by Machin and West examined two issues: (1) the impact of the introduction of academies on the enrollment mix in academies and neighboring schools; and (2) the effect of academies on nearby residential property values. Machin and West found that schools that converted to academies experienced a significant increase in the quality of their students, but that this increase appeared to come at the expense of nearby secondary schools, which experienced a decrease in test scores of admitted pupils. Machin and West also found that house prices in the area of an academy conversion rose by about 7 percent.

UNLINKING EDUCATION AND LOCATION

The last part of the volume includes three chapters that emphasize the unlinking of location and K–12 education.

Elizabeth J. Mueller and Shannon S. Van Zandt's chapter "Beyond 'Accidents of Geography': Using Housing Policy to Improve Access to Quality Education" argues that private restrictive covenants, land use and zoning regulations, and federal housing policies have played a major role in creating income and racial segregation. In turn, public school systems funded by property taxes tie school performance to segregated housing. But the bulk of the chapter focuses on two types of policy remedies: (1) housing vouchers and housing counseling that attempt to move low-income and minority households to neighborhoods with better schools (mobility-based policies); and (2) efforts to enrich educational and other services for low-income and minority households (community-based policies). They examine two case studies for the lessons they provide: the Inclusive Communities Project in Dallas, Texas, a mobility project, and Foundation Communities in Austin, Texas, a community-based project. The authors argue that both approaches are needed and both can be effective, but that policy makers using these approaches must use them flexibly, adapting to the opportunities and constraints presented by the particular city in which the policy is being used.

The second chapter in this part of the book explores a fascinating international example of innovation in school choice. In 1980, Chile implemented a universal education voucher. This makes Santiago, a city that exhibits a high degree of residential segregation, an excellent case study of whether school choice can reduce the school segregation inherent in residential segregation. Carolina Flores used census data, mathematics achievement scores from the National System for the Measurement of the Quality of Education (SIMCE), and a survey of about 1,000 parents in segregated and mixed neighborhoods of low, middle-

low, and middle socioeconomic status to test hypotheses addressing this central question.

In her literature review, Flores notes that other researchers have found that Chilean school socioeconomic segregation is even greater than residential segregation. In her research, she found that parents in segregated neighborhoods are more likely to choose local schools than parents in other neighborhoods, perhaps because of a lack of information about school quality. This enhances the segregation of schools, with detrimental effects on student achievement, since test scores for schools in poor, segregated neighborhoods are lower than for all other types of neighborhoods.

Luke C. Miller addresses homeschooling, a form of school choice that has been increasing rapidly and in which students now outnumber those attending charter schools. Using school division-level data in Virginia (districts are called divisions in that state), Miller sought to answer four questions:

1. What are the homeschooling trends in Virginia?
2. What types of communities more strongly prefer homeschooling?
3. In what types of communities is enrollment in homeschooling relative to enrollment in public schooling growing the fastest?
4. What community and school characteristics impact preferences for homeschooling?

Miller compared his statistical compilations and regression results with earlier studies of homeschooling in Kentucky and Wisconsin.

Homeschooling in Virginia increased almost 14 percent per year from 1995 to 2012, when homeschoolers accounted for 2.5 percent of all home school and public school students. Middle school students and students from rural communities are more likely to be homeschooled than other students in Virginia. Homeschooling is more common and growing faster in more politically conservative communities there. These findings reinforce previous research on homeschooling in Kentucky and Wisconsin.

Unresolved Issues

This volume makes clear that there is no simple connection between the rise of school choice and the education-location link. When considering traditional brick-and-mortar schools, the move from traditional public schools to school choice options changes the nature of the education-location link but does not eliminate it. This is because parents prefer to send their children to nearby schools, and transportation costs restrict the schooling options for any child. One unresolved question is the degree to which school choice has effectively severed the link between education and location once parental preferences for neighborhood schools and transportation constraints are taken into account. A second question

is the degree to which fast-growing forms of school choice, such as homeschooling, and newer forms of school choice, such as virtual charter schools,[8] can unlink education and residential location.

A critical issue that has been well studied is the effect of school choice on student achievement. This volume presents new empirical evidence and summarizes existing studies on the effect of charter schools on academic achievement, but other studies tackle that same question for interdistrict choice, intradistrict choice, magnet schools, and vouchers (Loeb, Valant, and Kasman 2011; Phillips, Hausman, and Larsen 2009; Siegel-Hawley and Frankenberg 2011). Unfortunately, the lack of data on homeschooling makes it impossible to study the effect of that form of school choice on academic achievement.

One challenge to the research in this area is the degree to which results in one geographic area can be applied to another, or to put it another way, the extent to which results in that area are context dependent. Some findings appear to be widespread and robust across geography, such as the impact of test scores on house values. Others do not, with the education voucher in Chile a case in point. As Brunner describes in his literature review chapter, the theoretical and empirical literature on school choice points to the conclusion that the introduction of choice is likely to lead to a "reduction in residential income stratification across neighborhoods." However, Chile's universal school voucher has not had that effect. In contrast, a large body of literature has focused on the persistence of economic stratification under Chile's school choice system (Portales and Heilig 2012).

Conclusions

Although links exist between education, land, and location for countries around the world, these links have been particularly important in the United States, with its decentralized system of public education and local control, which is often dominated by property tax funding. In the 1960s, approximately one in ten schoolchildren in the United States used a school choice option; today the best available data indicate that between one-quarter and one-third of schoolchildren do so.

The introduction of new forms of school choice and the growing importance of school choice weaken the links between education, land, and location. Researchers have hypothesized that breaking those links will raise property values in areas with poor schools and lower property values in areas with good schools and that residential segregation will fall. Two critical policy questions

8. According to research by the National Education Policy Center, virtual schools (including cyber charters) "now constitute one of the fastest-growing forms of school choice" (Miron, Horviz, and Gulosino 2013, 25). In 2012, 200,000 students attended 311 full-time virtual schools in 30 states and the District of Columbia. Cyber schools can be operated by charters, districts, or states.

are whether school choice will contribute to higher academic achievement and whether it will decrease school segregation by race, ethnicity, and income. One might expect the answers to these questions to differ depending on the type of school choice—private schools or homeschooling, for example—and the region of the country, as some parts of the country have more decentralized systems of K–12 education than others.

Among school choice options, some are likely to improve academic achievement, such as charter schools serving inner-city minority children, whereas others may not. Also, some options are likely to reduce school segregation, such as the magnet schools designed for this purpose in the 1960s, but broad programs of school choice are likely to increase school segregation.

It is important for policy makers and the policy analysts who advise them to recognize that decisions regarding school choice, school finance, and broader education policy have impacts far beyond the classroom that play out in a complex world where household location and transportation decisions, housing markets, and local governments all interact. In this way, decision makers can be leery of simple answers and alert to unintended consequences.

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