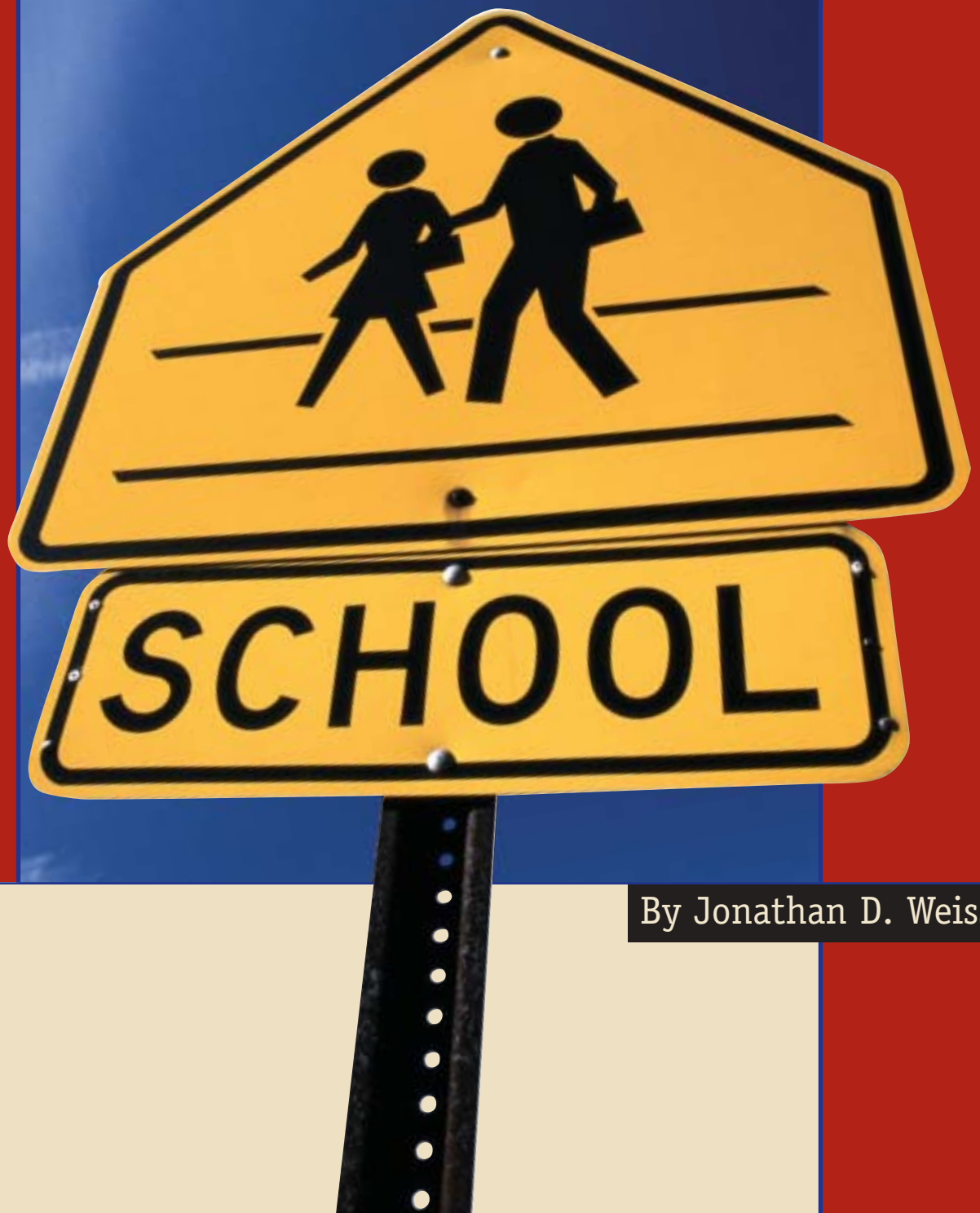


Public Schools and Economic Development

What the Research Shows



By Jonathan D. Weiss

There is a clear consensus among researchers that **education enhances productivity.**

Research indicates that quality public schools can help make states and localities **more economically competitive.**

Public schools **indisputably influence residential property values.**

Emerging evidence suggests that the quality, size, and shape of school facilities themselves **affect economic development.**

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I. Introduction

“[Education] is the best investment we can make – one that pays off in countless dividends, for us, for our children, and for our society . . . If we hope to maintain or improve the quality of life in our communities, attract new industries, and continue to prosper as a nation, top-notch schools are essential.” (*American Association of School Administrators 1999*)

It has often been asserted, particularly by education advocates and public leaders, that high-quality public schools have a positive impact on economic development. This argument has been increasingly made at all levels. Among the many governors known for their interest in education, Arkansas Governor Mike Huckabee (2002) states matter-of-factly, “Looking for salvation for the [Mid-South] Delta? Look no farther than the public schools. If we improve them, economic development will follow.”

With respect to local officials, the U.S. Conference of Mayors (1999) asserts, “. . .the economic vitality of a city is linked to the performance of its schools . . .” According to the National League of Cities’ survey of its members in 2000, “it is clear . . . that city officials view the quality of public education and local schools as the cornerstone of their cities’ success.”

As for the general public, in a recent public opinion survey the assertion that public schools “improve the local economy and attract business” was identified as the second most important benefit which schools bring to communities (Education Week and Public Education Network 2002). The only benefit of public schools ranked above local economic improvement was the “benefit [to] families.” Below economic improvement, survey respondents ranked other benefits such as lowering crime rates, creating community pride, and instilling civic values.

Education has also been a field of growing interest for economists. Since 1970, the percentage of academic studies within the economic field that address the topic of education has grown by more than fourfold (Krueger 2000). However, this literature, while very strong in particular areas, is often compartmentalized, rather than brought together as a whole. Furthermore, for even the most talented and ambitious researchers, the complexity of the education/economic relationship at all levels causes measurement difficulties that belie easy answers. Given how often the theme is mentioned in public debate, it is stunning that few studies or compilations describe how public schools can or cannot benefit the economy at both the national and local level.

Meanwhile, advocacy groups with an interest in this subject, mainly education organizations and local development associations, have rarely combined their efforts. When these advocates—or the general public—do make the economic case for public schools, the facts behind their assertions are rarely mentioned. If public schools can impact economic development, how so?

This subject seems particularly important given today’s economic climate and the demands of

increased global economic competition. While public opinion continues to value education highly, all levels of government face increasing pressure to reduce spending or to spend more efficiently. Also, given the recent rise in interest in how to better link public schools with their surrounding communities, the economic nature of those linkages is beginning to receive more attention. Smaller, more neighborhood-based schools, some suggest, can benefit student learning as well as community and economic revitalization efforts (National Association of Realtors 2002, Chung 2002, Lawrence, et al 2002).

The purpose of this paper is to provide an overall review of the literature that addresses the linkage between public schools and economic development. It attempts to provide as complete a picture as possible in an accessible style. While emphasis is placed on academic research, organizational reports and coverage from more popular media are also included. An extensive list of sources used (both referenced in the text and additional material) is included at the end of this report.

The review will explore the literature related to four key potential economic impacts of public schools: 1) national economic growth and competitiveness; 2) state and local economic growth and business attraction; 3) residential real estate values; and 4) the impact of public school facilities themselves. Each of these four areas represents arguments made in asserting the connection between public schools and economic development. The review found:

- Strong research detailing the impact of education on national economic growth and competitiveness: investing in the skill level of a nation's population increases national productivity, and education leads to higher wages.
- Emerging research on how public schools influence state and local economic growth and attract new business: schools educate the local labor force and can also increase an area's quality of life in order to attract skilled workers to it.
- Strong research on the impact of public schools on the real estate values of their surrounding communities: homes in high-performing school districts sell for more than homes in low-performing school districts.
- Emerging research, with anecdotal evidence, on how public school facilities themselves impact economic development, particularly in distressed areas: school facilities that are small, local, and community-oriented can particularly affect local development.

While the existing research is uneven and needs to be more fully developed in certain areas, it is clear that public schools can indeed have a beneficial impact on economic development.

II. The Link Between Education and National Economic Growth

With more than 86 percent of students in the U.S. attending public schools (Annie E. Casey Foundation 2003), public schools markedly influence educational quality in our country.

The critical relationship between education and national economic growth has been well explored by academic research. This section divides that research into two themes:

- How so-called “human capital,” the investment in the skill level of a nation’s population, can influence national productivity (Haveman, Bershader and Schwabish 2003, Koh and Leung 2003, Sianesi and Van Reenen 2003, Hanushek 2002, World Education Indicators 2002, Barro 2000, Hanushek and Kimko 2000, Barro and Lee 1996, Pritchett 1996); and
- How education can lead to higher wages, increased employment stability, and social equality (Carnevale and Desrochers 2002, Day and Newburger/U.S. Census Bureau 2002, Gradstein and Justman 2002, McGranahan and Teixeira 2001, Topel 1997, Card and Krueger 1996a).

Taking the research as a whole—including studies focused on both domestic and international data, as well as various theories discussed—the findings strongly indicate that a nation’s educational system helps determine the quality of its labor force and therefore the health of its economy.

A) Education as an Investment in Human Capital

Impact on National Productivity and Competitiveness

There is a clear consensus among researchers that education enhances productivity. In a review of a number of studies, “The Returns to Education: A Review of the Empirical Macro-Economic Literature” published in the *Journal of Economic Surveys* (2003), Barbara Sianesi and John Van

Reenen find “compelling evidence that human capital increases productivity”—that “education really is productivity-enhancing.” The studies they review relied on a variety of data from the U.S. and abroad.

A number of new studies (not discussed by Sianesi and Van Reenen) confirm their conclusion. A recent study of note is “Financing Education—Investments and Returns” (2002), conducted by the World Education

Indicators program (WEI), an organization run by several international agencies. The report focuses on a number of developed and developing countries outside the U.S. It measures

There is a clear consensus among researchers that education enhances productivity.

educational attainment (in years of schooling completed) and economic growth rates in these countries, and finds that each additional year of schooling increases a nation's long-term growth rate by 3.7 percent. The results also show that educational attainment reduces the unemployment rate and increases wages.

The study discusses the “virtuous cycle” that results from educational investment—that investment in education improves society's level of knowledge as a whole. Defining the benefits of education in economic terms, the report states that “with effective investment, this key economic resource can become a renewable one, because, in theory, human knowledge and its applications are, unlike many natural resources, infinite.”

Eric A. Hanushek and Dennis D. Kimko's study of “Schooling, Labor-Force Quality, and the Growth of Nations” in *The American Economic Review* (2000) also concludes that labor-force quality, upon which education is the strongest proven influence, has a “consistent, stable, and strong relationship with economic growth.” By analyzing international achievement test scores in multiple countries, including the U.S., and Gross Domestic Product (GDP) in each country, they find “clear evidence” of the causal relationship between school quality and national productivity.

Hanushek follows up on this conclusion in his chapter “The Importance of School Quality” in *Our Schools and Our Future: Are We Still at Risk?* (2002). Drawing on data from the earlier study with Kimko, he argues that both *quality* (educational achievement, usually measured by standardized test scores) and *quantity* (educational attainment, measured by years of schooling) are essential to increasing human capital and maintaining national competitiveness. In the U.S., he notes, the quantity of schooling has substantially increased over the past century as the nation has made secondary education available to the majority of its citizens.

Hanushek finds that quality, however, has suffered because the U.S. educational system has provided more schooling but “with less learning each year.” Though this approach has paid off for the U.S. in terms of global economic success, Hanushek argues it may not continue to do so as other countries “catch up” to the U.S. in quantity of schooling. Thus, he suggests that the more difficult but more important long-term goal of the U.S. should be to improve educational quality, or achievement at each grade level.

In “The Missing Middle: Aligning Education and the Knowledge Economy” prepared for the U.S. Department of Education (2002), Anthony P. Carnevale and Donna M. Desrochers agree that investment in both educational quality and quantity is essential to maintaining U.S. economic competitiveness. Based on a review of previous empirical studies linking education to growth, they argue that as other nations acquire financial capital and technology, “the quality of human capital will become the decisive competitive edge in global competition.” The consequences of not investing in education will be a decline in U.S. productivity and a shift in jobs away from America. Carnevale and Desrochers estimate that if U.S. education improved to the level of education in Sweden (one of the most literate nations in the world), the U.S. GDP could increase by as much as \$463 billion.

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Debate Concerning the Education/Economic Link

Although a number of analyses have demonstrated a link between education and economic growth, not all researchers agree. For example, in “Educational Attainment, Economic Progress, and the Goals of Education in Rural Communities” in the *Journal of Research in Rural Education* (1999), Robert B. Pittman, Dixie McGinty, and Cindy I. Gerstl-Pepin, argue that the relationship between education and economic improvement has been assumed but that little empirical proof exists, with the exception of a few biased studies. They note that schools are successful at reducing unemployment, for example, only if there are already “enough jobs to go around.” They also suggest that the pervasive focus on how schools improve the economy detracts from alternative theories such as how education improves individual contributions to the community.

Lant Pritchett contends that human capital actually has a *negative* effect on economic growth in “Where Has All the Education Gone?” prepared for The World Bank Research Department (1996). Pritchett’s approach is similar to that of other human capital researchers (World Education Indicators 2002, Barro 2000, Hanushek and Kimko 2000, Barro and Lee 1996) in that he compares economic growth rates to educational attainment levels across several countries, but his results are quite different. Pritchett, concluding that additional education reduces productivity, attempts to explain his results with three possible theories: (1) that schooling does not create human capital; (2) that some countries’ low demand for educated workers reduces educational returns; or (3) that some countries have inefficient, bureaucratic economies wherein most human capital actually reduces productivity.

Sebastien Dessus, in “Human Capital and Growth: the Recovered Role of Educational Systems” in a World Bank Tool (1999), argues that Pritchett relies too heavily on educational attainment (quantity) as a predictor, ignoring the potential differences in school quality from one economy to the next. Dessus also emphasizes the importance of equal distribution of education. He argues that increased education that is concentrated in a small portion of the population, rather than equally distributed, may partially explain the negative correlation that Pritchett finds. Dessus’ argument is more plausible than that of Pritchett, since it recognizes in a more comprehensive way the multitude of factors that may impact economic effects of education positively or negatively.

The impact of education on productivity may be even more significant in a technology-based economy...

Impact of Education on Technology-Based Economies

The impact of education on productivity may be even more significant in a technology-based economy such as the U.S. than in non-technology-based countries (Koh and Leung 2003, Carnevale and Desrochers 2002, McGranahan 2001). In “Education, Technological Progress and Economic Growth” (2003), a working paper for the Singapore Management University, Winston T. H. Koh and Hing-Man Leung find that education not only increases the skill level of the work force, but also improves adaptability to new ideas and new technologies. Like the authors of the

WEI study, Koh and Leung develop an empirical model comparing education and productivity among countries. Their results reflect another version of the “virtuous cycle” but in this case, the mechanism is for education and technology to benefit each other. The returns to education are highest when technology is improving, and education in turn heightens technological development by expanding the technological “frontier.”

Psychologists and sociologists have clarified how this “virtuous cycle” functions by discussing how the complex environment of a technology-based society improves intellectual functioning. A daily life that requires the use of technology increases individual knowledge and reasoning ability—individuals essentially learn by doing. A more educated work force is thus more able to increase productivity by adapting to technology and by applying reasoning skills to the workplace (Carnevale and Desrochers 2002, Greenfield 1998, Schooler 1998).

In contrast, insufficient education can inhibit economies from reaching their full technological potential, argue Ruy Teixeira and David A. McGranahan in “Rural Employer Demand and Worker Skills,” in *Rural Education and Training in the New Economy: The Myth of the Rural Skills Gap* (2001). Teixeira and McGranahan draw on the results of the 1996 Rural Manufacturing Survey (RMS), which was conducted by the Economic Research Service of the Department of Agriculture.

The authors suggest that a lack of educational infrastructure in parts of the southern U.S. in particular may be limiting the ability of businesses in that region to successfully apply new technology. In the survey, most rural manufacturers cited “quality of available labor” as their most pressing problem, and those manufacturers employing technology to a high degree were more likely to encounter the problem. Specifically, these technology-oriented manufacturers identified a lack of problem-solving and technical (non-computer) skills as an obstacle to productivity. Many of these firms have also seen an increased demand for computer and interpersonal skills in recent years.

The skilled labor shortage appears to vary with the educational level in each region. For example, the RMS data shows that in counties where less than 75 percent of the population has a high school education, more than 40 percent of the technology-based manufacturers identify a shortage of problem-solving skilled labor, but in counties where 90 percent of the population is high school educated, only 30 percent of technology-oriented firms report the problem. Such an emphasis on obtaining new skills can put greater emphasis on adult education. According to the RMS data cited by the authors, 82 percent of rural firms adopting technology have increased training in recent years.

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B) Education’s Impact on Worker Wages and Social Stability

Education and Worker Wages

In addition to the general impact of education on productivity addressed above, education leads to higher wages and increased employment stability for individuals (U.S. Department of Labor 2004, Carnevale and Desrochers 2002, Day and Newburger/U.S. Census Bureau 2002,

Hanushek 2002, U.S. Department of Education 1997, Krueger and Card 1996a). Krueger and Card's literature review, "Labor Market Effects of School Quality: Theory and Evidence," published in *Does Money Matter? The Link Between Schools, Student Achievement and Adult Success* (1996), summarizes the research through 1996, with a focus on U.S. studies. Krueger and Card find evidence throughout the literature that additional schooling, higher quality schooling, and increased school spending each directly results in increased wages later in life. They find that a ten percent increase in school spending can result in two percent greater earnings later in life.

Hanushek (2002) draws a similar conclusion based on the research in this area (citing some of the same studies as Krueger and Card and more recent work). Much of the more recent work cited by Hanushek focuses on achievement test scores as a predictor of economic success. In short, these recent studies show that higher achievement test scores predict higher earnings. A study prepared by the U.S. Department of Education National Center for Education Statistics (1997) indicates that both additional schooling and higher test scores increase employment stability and lead to higher wages within the U.S. work force. Other data from the Center (1995) show that high school dropouts are three times more likely to receive public assistance than high school graduates not attending college.

J.C. Day and E. C. Newburger of the U.S. Census Bureau illustrate the same conclusion in "The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings" (2002). By surveying annual and lifetime earnings for adults age 25-64, they find that earnings increase significantly with educational level. Annual wages for high school dropouts average \$18,900,

increase to \$25,900 for individuals with a high school diploma, and increase to \$45,400 for individuals with a college degree. Lifetime earnings show the same pattern. A high school diploma increases average lifetime earnings by \$200,000, and a bachelor's degree increases such earnings by an additional \$600,000. (Further, the College Board in its report *Trends in College Pricing 2002* (2002) estimates that a bachelor's degree (or higher) increases earnings by more than \$1,000,000.)

Thus, a college education may increase earnings potential even more than secondary education. Moreover, adult training programs, as shown by the National Center for Education Statistics (1997), can also raise the educational and skill level of the U.S. workforce, and workers who have participated in training at their current job are able to earn up to \$140 per week more than those who have not.

Carnevale and Desrochers (2002) recognize the increased earnings potential from a college education and specifically address the role that quality primary and secondary education plays in preparing students for college. By comparing data from the 1974 and 2001 Current Population Surveys, the authors note that an increasing number of U.S. jobs require some college education, and they speculate that the U.S. may face a shortage of college-educated workers over the next twenty years as the "baby boomers" retire. They argue that improved primary and secondary

Both additional schooling and higher test scores increase employment stability and lead to higher wages within the U.S. work force.

education, including both applied learning (such as vocational training) and general academic programs, is essential to overcoming this shortage.

Education and Social Impact

Education can also make the U.S. more economically competitive by helping to close the gap between socio-economic classes. Carnevale and Richard Fry argue in *Crossing the Great Divide* for the Educational Testing Service (2000) that “if Hispanics and African-Americans had the same education and commensurate earnings as whites, the national wealth of African-Americans and Hispanics could increase annually by \$113 billion and \$118 billion.” They suggest that higher educational attainment would allow these individuals to fill high-paying jobs that are currently going to foreign workers and help close the gap between socio-economic classes.

Education can also promote “social capital.” Mark Gradstein and Moshe Justman in “Education, Social Cohesion, and Economic Growth,” in the *American Economic Review* (2002) describe social capital as the “economic benefits of education as a socializing force” that result by minimizing the “social distance” between groups. They note the “common socialization” that public education provides—the social norms it teaches, the interaction among cultural groups that it facilitates, and the national identity that it helps to establish. (The term “social capital” was popularized by Robert D. Putnam’s book *Bowling Alone* (2000), in which he defines “social capital” as the value of social networks because “social contacts affect the productivity of individuals and groups.”)

Gradstein and Justman develop an empirical model showing that economic growth is hampered when cultural groups are segregated within a school district. They conclude that more cross-cultural socialization, in the form of more integrated schooling, would reduce the “social distance” among classes, thus allowing for more efficient economic transactions among these classes and ultimately a more productive economy.

Robert H. Topel presents a more complicated analysis of education and the wage gap in “Factor Proportions and Relative Wages: The Supply-Side Determinants of Wage Inequality” in *The Journal of Economic Perspectives* (1997). Comparing wages and educational attainment in multiple countries, including the U.S., Topel’s empirical results cast doubt on whether education is narrowing the wage gap. Nonetheless, he draws positive conclusions regarding the impact of education on equal opportunity. “Human capital investment can reduce overall inequality even in the absence of wage adjustments,” Topel writes. He further suggests that “equalization of opportunity” through improving the skill level of the least advantaged citizens may be even more important than equalization of wages.

If Hispanics and African-Americans had the same education and commensurate earnings as whites, the national wealth of African-Americans and Hispanics could increase annually by \$113 billion and \$118 billion.

III. The General Impact of Public Schools and School Spending on State and Local Economic Growth and Business Attraction

A) The Impact on State and Local Economic Growth

The Overall Impact of Public Schools on State and Local Economies

Studies exploring the link between public schools and the economy recognize in general terms that public schools impact state and local economies in many ways (National Education Association 2003, ECONorthwest 2002, Gottlieb and Fogarty 1999, Adler 1997, Kerchner 1997, Picus and Bryan 1997, Sederberg 1987, Brisson 1986). In addition to raising national productivity as seen in the last section, research indicates that quality public schools can help make states and localities more economically competitive.

Paul Gottlieb and Michael Fogarty, in a report for the Case Western Reserve Center for Regional Economic Issues (1999) on the education levels of the nation's largest metropolitan areas, confirm that

a highly educated workforce improves the economic performance of metropolitan regions. The authors suggest that employers draw workers from both outside their region and inside their region, and that regions should not only make themselves more attractive in order to draw skilled workers from outside their area, but also invest in human capital, stress high school preparation and increase matriculation rates locally.

Similarly, E. Glaser and J. Shapiro, in "City Growth and the 2000 Census: Which Places Grew, and Why" (2001), published by the Brookings Institution, compare 2000 census data with 1990 census data. They find that "high human capital cities" grew faster, meaning that growth rates varied directly with the average educational level of each city. Several researchers conclude that a better educated local workforce can produce a better paid workforce, adding to wealth in a region (Gottlieb and Fogarty 1999, Burtless 1996, Card and Krueger 1996a, 1996b).

Community-oriented high schools (discussed in Section V) that offer adult and vocational training programs can enhance the local skilled labor force, help develop entrepreneurial skills and business startups, and transition new workers into the local market (Bailey, Hughes, and Mechur 2001, Lynch 2000, Thuermer 2000, Grubb 1995, Ramsey 1995, Brisson 1986). For "school-to-work graduates," some studies show that once these graduates choose to enter the labor market, they are more likely to gain employment and earn higher wages than comparable groups (Institute on the Economy and Education 2001).

It is not completely clear, however, what percentage of locally educated students remain in a given region for their careers. Thus, it is important to remember that regions need more than good public

Research indicates that quality public schools can help make states and localities more economically competitive.

schools to promote economic development. As Joseph Cortright points out in his study for the Economic Development Administration, *New Growth Theory: Some Thoughts and Implications for Economic Development* (2001), "...regions with great educational systems (and little else) may end up exporting their best and brightest..." Public schools are an important economic tool, and can be integrated with other aspects of economic development, such as developing other social capital and improving quality of life. As discussed above, Gradstein and Justman explore how public schools can foster social capital. According to the authors, public schools help connect socioeconomic groups, enhancing the opportunity for economic transactions and thus improving the local economy. Future research should expand upon and test this thesis.

Finally, as a basic local industry, public schools are major local employers, with payrolls extending from teachers and administrators to construction workers. Schools are also major consumers of professional services, with expenditures for supplies ranging from instructional materials to items for repair or maintenance (National Education Association 2003, ECONorthwest 2002, Adler 1997, Kerchner 1997, Picus and Bryan 1997, Sederberg 1987, Brisson 1986). By their location, public schools can arguably help draw retail establishments to nearby locations (Wachter 2003). Schools are also potential credit investors, and by placing their accounts in local banks they give banks more money to loan to local businesses and entrepreneurs (Adler 1997, Kerchner 1997, Sederberg 1987).

The Impact of Education Spending on State and Local Economies

Several economists address the effect of state and local education spending on economic growth, but this effect is very difficult to measure accurately. In a review of these studies, Roger Fisher in "The Effects of Local Public Services on Economic Development" in the *New England Review* (1997) found that of 19 studies that address the effects of education spending on economic development, 12 show a positive relationship and 6 show a "significant positive relationship." Overall, however, he finds the empirical evidence "quite cloudy" and attributes this in large part to measurement problems, particularly the difficulty of using school spending as a measure and finding accurate connections between spending and economic development.

One of the studies finding the strongest correlation between spending and economic development is by Teresa Garcia-Mila and Therese McGuire, "The Contribution of Publicly Provided Inputs to States' Economics," in *Regional Science and Urban Economics* (1992). This study considers data over a fourteen-year period for the 48 contiguous states. It uses both education spending and median years of schooling as measures and finds that both are statistically significant and positively impact gross state product.

While there is some dispute about the precise impact of public school spending on student performance, most researchers conclude that efficient public school spending (an "input") can increase student achievement (an "output") (Wenglinsky 1997, Hanushek 1996, Hedges and

Efficient public school spending can increase student achievement.

Greenwald 1996, Ferguson 1991). Because of the uncertainty in this area and the difficulty of adequately measuring so-called “inputs” and “outputs,” researchers are developing alternative methods to explore whether additional public school spending increases student performance and economic development.

The Impact of Education Spending on Real Estate Values

Studies are beginning to look particularly at the relationship between school spending and housing values. As will be discussed in detail in section IV, the strongest research undertaken on the link between education and local economic growth focuses on how schools in general can promote local real estate values. The studies that focus specifically on *spending* and housing values are addressed here. These studies conclude that the real estate market implicitly recognizes school spending’s economic impact by observing the property value increase in neighborhoods containing higher-spending schools (Barrow and Rouse 2002, Black 1999, Bogart and Cromwell 1997).

Thomas E. Dee’s “The Capitalization of Economic Finance Reforms” in the *Journal of Law and Economics* (2000) finds that new educational expenditures (in this case, court-imposed) substantially increase median housing values and residential rates. Similarly, in their National Bureau of Economic Research study, “Using Market Valuation to Assess Public School Spending” (2002), Lisa Barrow and Cecilia Elena Rouse find that real estate values increase by \$20 for every additional dollar in state educational funding. Additionally, Sandra Black finds that in Massachusetts, a \$500 increase in per-pupil expenditures increases average home prices by 2.2 percent in “Do Better Schools Matter? Parental Valuation of Elementary Education” in *The Quarterly Journal of Economics* (1999).

William T. Bogart and Brian A. Cromwell, in their study “How Much More Is a Good School District Worth?” in the *National Tax Journal* (1997), find that home buyers are willing to pay higher taxes for better schools because the resulting increase in real estate value is even higher than the additional taxes. This theme (and several other studies) will be discussed further in the section on the impact of public schools on local real estate value.

Statewide Study Regarding the Economic Impact of Education Spending

Recent studies carried out by advocacy groups help to shed light on the short-term stimulus impacts of public school investment. ECONorthwest conducted an in-depth report for the Oregon Education Association, the Oregon School Boards Association, and the Confederation of Oregon School Administrators entitled “K-12 Spending and the Oregon Economy” (2002). Arguably the most extensive research published on the impact of

school spending in a particular state, this report links statewide school spending on employee salaries and purchases of goods during the 2000-2001 academic year with the Oregon economy.

The study clearly points out that it does not take into account the potentially depressing economic impact that taxes for public schools might have on the economy. With this caveat, the research reports the direct and indirect economic impacts of “school funding [that] finances salaries for teachers and classified staff, building construction, materials, and school supplies” as well as the economic results when “school employees take their salaries and make mortgage or rent payments, buy groceries, purchase a host of other goods and services, and pay taxes.”

The report describes public education as Oregon’s largest local government employer, with a payroll consisting of 56,000 employees in 2000-2001. Beyond those directly employed by public education, public schools in Oregon also support 51,000 additional jobs through contracting and spending in the service, finance, real estate, and construction industries. This illustrates the “multiplier effect,” in which spending in one sector (education) adds jobs and incomes in other sectors of the economy. Altogether, public education supports 6.8 percent of Oregon’s employees, and pays 7.6 percent of the state’s total personal income. The study finds that 47 percent of school spending funds direct instructional activities, while 33 percent funds support services such as safety, counseling, health, psychological services, and staff development programs. The remainder is spent on services and supplies such as books, utilities, communication services, building repair and maintenance, and professional services.

The combined spending is substantial. Oregon’s public schools spend \$3.3 billion annually in the state. They also produce \$351 million in tax revenues through income taxes, corporate property taxes, and other indirect taxes. According to the study, public schools make up a larger percentage of the local economy in rural areas, but since urban school districts and their employees in urban areas can find goods and services nearby, the impact of this spending is magnified in urban regions.

Nationwide Study Regarding the Economic Impact of Education Spending

Meanwhile, the National Education Association is expected to publish by early 2004 a national, future-oriented report on “Schools, Funding, Taxes, and Job Growth” (2004) that simulates the potential economic impact of a hypothetical nationwide two percent increase in educational spending and a corresponding consumer tax increase. The pre-publication draft of the report provides hypothetical data for all fifty states from 2004 through 2020. According to the model used in the study, although the additional tax would decrease consumer spending power in the short-term, the increase in school spending in purchasing supplies and paying salaries would raise overall spending power in the long-term.

The study draft concludes that “the economic expansion from increased education spending overcomes contraction from the increase in taxes and has significant positive impacts in both the

near- and long-term for the economies of each of the fifty states.” This impact is largely due to the “ripple effect” resulting from hiring more employees who then use their salaries in the local economy.

B) The Role of Public Schools in Business and Worker Location Decisions

A much-discussed topic in the state and local economic development field is how best to attract businesses to certain areas. It is often argued, as described in the Introduction, that quality public schools can play a role in business attraction and worker recruitment efforts. However, there have been few studies investigating this connection, as researchers find it challenging to measure how such location decisions are made. Still, there is an emerging literature in this area, including some surveys, anecdotal evidence, and expert opinion, showing that public schools can influence both business and worker location decisions.

Public Schools and the Importance of Quality of Life

The available evidence suggests that businesses seek an existing educated workforce—or, increasingly, the ability to draw such a workforce to their chosen location (Wolkowitz 2003, Deal 2002, Burnson 2000, Venable 2000, Karakaya and Canel 1998, Segedy 1997, Gottlieb 1995). Schools may play a part in both finding and attracting qualified workers. The need for businesses to draw from an *existing* educated workforce often presumes the need for quality local public schools. In drawing *new* workers to an area, however, public schools are also important as a consideration in assessing the quality of life in the area.

Recent research emphasizes the increasing importance of locating businesses in places with a high quality of life that will attract future workers, and the quality of public schools has increasingly begun to fit in under the rubric of a community’s general quality of life (Salvesen and Renski 2003, Florida 2002, Urban Land Institute 2002, McGranahan 2000 and 2002, Florida 2000, Burger 1999, Love and Crompton 1999, Segedy 1997).

In their article “The Role of Quality of Life in Business (Re)Location Decisions” in the *Journal of Business Research* (1999), Lisa Love and John Crompton discuss the results of a survey of 174 businesses that had started, relocated, or expanded in Colorado within the previous five years. They find quality of life considerations to be most important to certain types of companies: those that are small, not fixed to a set location, highly professional, or moving from out of state, especially if the company’s top decision-maker relocated with the company. In his chapter “How Important is Quality of Life in Location Decisions and Local Economic Development?” in *Dilemmas of Urban Economic Development* (1997), James Segedy states that “[r]eaders of Site Selection magazine [the leading magazine of the business site selection industry] have recognized quality of

The quality of education is often a factor in determining a community’s quality of life.

life as the most influential location decision-making factor since 1988.”

What constitutes quality of life differs from study to study, but, according to research, the quality of education is often a factor in determining a community’s quality of life (Salvesen and Renski 2003, The World Economic Development Alliance 2002, Meredith Corporation 2002, Segedy 1997). Segedy reports that, from the perspective of the site selection and economic development industries, public education was ranked fourth in importance among ten quality-of-life factors. The top three factors in order of importance were cost of living, higher education, and “nature-oriented” outdoor options.

A survey undertaken by Segedy and others (1994) of fifty Indiana communities found that when quality of life does become an important location factor—as it often does with technology-related companies—“economic development professionals consistently rate education at or near the top of the list.” Love and Crompton’s survey found that 10 percent of businesses held primary and secondary education to be extremely important, 29 percent to be very important, 21 percent to be somewhat important, 17 percent to be slightly important, and 24 percent to be unimportant.

Some business-related surveys of cities include public education in ranking the community’s quality of life (The World Economic Development Alliance 2002, Meredith Corporation 2002), while others do not (American Electronics Association 2002, Development Counsellors International 2002, Harris Interactive 2002). Surveys ranking cities’ business climates generally do not consider education (Area Development 2002, Forbes 2002, U.S. Chamber of Commerce 2002, Penton Media 2002). However, in certain places such as Miami, public education is such an important quality of life issue that it affects business climate. In “Jobs Will Follow Better Schools, Say Miami-Dade Leaders” in *Education Week* (1997), the Greater Miami Chamber of Commerce named public education as “the region’s biggest barrier to economic development.”

The Greater Miami Chamber of Commerce named public education as “the region’s biggest barrier to economic development.”

Location Decisions of Lower-skill Industries

There is general agreement that public education does play some role in the site location of lower-skill industries (Bucciarelli 2003, McCandless 2003, Warden 1986). These businesses depend highly on the state and local school system to produce competent workers with adequate interpersonal skills (McCandless 2003), and value high school training and apprentice programs (Bucciarelli 2003).

Supporting this view are case studies, like the study by Matthew Murray, Paula Dowell, and David Myers (1999) for the Tennessee Department of Economic Development, on the location decisions of automotive suppliers in Tennessee. The researchers, based on a mail survey of automotive suppliers considering locating in Tennessee, find an “increasing concern regarding the skill level and availability of workers, with poor public education being a frequently cited

shortcoming of the state.” This work echoes the conclusions of McGranhan in studying the rural South, discussed in Section II.

Location Decisions of Higher-skill Industries

In contrast to the viewpoint on lower-skill industries, debate exists about the extent to which knowledge-dependent companies pay attention (and the extent to which local areas wishing to attract such companies should pay attention) to the quality of public schools. For example, Mary Ellen McCandless, in her article “The State of Education” in *Business Facilities* (2003), argues that the quality of the public school system is not a major factor for businesses seeking skilled employees. These businesses, according to McCandless, do not depend as much on local public schools for an educated workforce because they only recruit employees that have completed post-secondary education.

However, quality of life does seem to be an increasingly important consideration when higher-skilled employees consider where they want to live. Richard Florida, in his influential book *The Rise of the Creative Class* (2002), concludes that educated, skilled workers—a group he calls the “creative class”—consider quality of life extremely important in where they settle. In his argument, because the “creative class” will likely choose to live in communities with a high quality of life, these areas will have a higher population of skilled workers and may influence business location decisions. However, he does not consider local public schools to be a strong part of quality of life and instead notes factors such as universities, diversity, nightlife, and recreation, among others.

Although Florida himself pays scant attention to public schools, interestingly, the business community in Austin, Texas, one of the cities Florida considers high in “talent” and “creativity,” is increasingly recognizing the importance of investing in public education. The *Austin American-Statesman* (2002) reports that Austin economic development efforts clearly emphasize education as part of their agenda to improve the economy and attract the creative class. According to an official with the Greater Austin Chamber of Commerce quoted by the newspaper, “Without a good school system, you’re not going to have industry.”

Quality of life does seem to be an increasingly important consideration when higher-skilled employees consider where they want to live.

IV. The Relationship Between Public Schools and the Real Estate Value of Communities

While the influence of public schools on state and local development may be difficult to precisely gauge, one aspect of local development is clear—a host of academic studies argue that school quality has a direct and positive influence on residential property values. Research shows that, holding all else constant, homes in high-performing school districts sell for higher prices than homes in low-performing school districts (Kane, Staiger and Samms 2003, Barrow and Rouse 2002, Hilber and Mayer 2002, Downes and Zabel 2002, Figlio and Lucas 2001, Bogart and Cromwell 2000, Clark and Herrin 2000, Black 1999, Brasington 1999, Hayes and Taylor 1996). The impact can measure in the thousands of dollars and increase home values as much as fourteen percent (Figlio and Lucas 2001, Bogart and Cromwell 2000, Black 1999). In addition, as indicated earlier, increased school spending has been linked to significant increases in real estate values (Barrow and Rouse, 2002, Dee 2000, Black 1999), and several studies have shown that people are more willing to live in a neighborhood with good schools even if it means paying higher taxes (Bogart and Cromwell 2000, Hayes and Taylor 1996).

School quality has a direct and positive influence on residential property values.

The studies consider a variety of factors in analyzing school quality and its impact on property values, ranging from school spending and student/teacher ratio to achievement test scores and individual improvement over time. The researchers differ on which exact factors contribute to a “quality” school, and therefore which school characteristics increase property values. Nevertheless, the link between public schools and property values has been demonstrated in neighborhoods of high and low income ranges, in urban and suburban areas, and for homebuyers with and without children.

Key Studies Relating Public Schools and Real Estate Value

Sandra Black’s well-cited article “Do Better Schools Matter? Parental Valuation of Elementary Education” (1999) examines schools in the Boston suburbs. By comparing achievement test scores to house values, Black finds that a five percent increase in test scores leads to a willingness to pay 2.1 percent more for houses in areas associated with the scores. Based on this, she infers that if Massachusetts test scores increased by one point statewide, the state’s real estate market could gain almost \$70 million in value. As mentioned in the previous section, Black also notes that an increase in per-pupil expenditures also increases property values.

...an increase in per-pupil expenditures also increases property values.

Like Black, Thomas A. Downes and Jeffrey E. Zabel, in their study “The Impact of School Characteristics on House Prices: Chicago 1987-1991” for the *Journal of Urban Economics* (2002), also find that achievement test scores have an impact on property values. Their results indicate that home buyers are willing to pay more for a home close to a higher-scoring school. They acknowledge there may be an assumption of “access to information” underlying these results; in other words, the availability and distribution of test scores might impact the relative weight home buyers place on them.

Studying another indicator of school achievement, David N. Figlio and Maurice E. Lucas find a strong correlation between Gainesville, Florida’s real estate values and the state’s “report card” school ratings system in their study “What’s in a Grade: School Report Cards and House Prices” (2001) for the National Bureau of Economic Research. Controlling for other factors such as student test scores, Figlio and Lucas gauge the impact of a so-called “A”-scoring school versus a “B”-scoring school. They conclude that for median-size homes, an “A” school increases property values by more than seven percent over a “B” school. For larger homes and more expensive neighborhoods, the difference can be as much as fourteen percent. In Gainesville, they note, the scores are “readily available” to parents as they make their housing choices.

Some researchers interpret other test scores for measuring school quality and its correlation to property values. In their analysis of schools in northern and southern Dallas, “Neighborhood School Characteristics: What Signals Quality to Homebuyers?” for the *Economic Review* (1996), Kathy J. Hayes and Lori L. Taylor find that buyers are willing to pay more in sales price and in taxes for a particular school’s “marginal effect on students.” They define this “marginal effect” as the improvement in math achievement test scores that can be attributed to the individual school (as opposed to improvement observed at all schools in the district). The overall implication is again that home buyers are willing to pay a premium for school quality.

David M. Brasington uses a slightly different approach to analyze school quality in Ohio metropolitan areas in “Which Measures of School Quality Does the Housing Market Value?” for the *Journal of Real Estate Research* (1999). He focuses on test scores and other factors of school quality at the district level, and concludes that the “housing market consistently rewards” high-proficiency test passage rates as well as high expenditures per pupil and low pupil-teacher ratio (or class size).

David E. Clark and William E. Herrin’s study on “The Impact of Public School Attributes on Home Sale Prices in California” in *Growth and Change* (2000), finds that average class size within a school district is the strongest educational factor, and one of the most significant factors generally, in determining property values in Fresno County, California. In general, the smaller the class size, the bigger the increase in property values. In addition, the authors note that larger districts adversely affect property values, perhaps due to a perception of inefficiency, but that larger individual school size has a positive effect on values, perhaps due to a perception of increased course offerings. Finally, Clark and Herrin find that the greater the number of students taking the SAT and Advanced

Placement examinations (an approximation for the number of college-bound pupils within a district), the greater the property values within that district.

While the authors above have attempted to correlate individual measurements of school quality to property values, William T. Bogart and Brian A. Cromwell take a more comparative approach in their study “How Much More Is a Good School District Worth?” in the *National Tax Journal* (1997). For each of three Cleveland-area neighborhoods, they compare homes located on the border of two different school districts within a single municipality. They theorize that because the bordering homes are in the same municipality, the school district is the only difference. Thus, any difference in real estate value, they conclude, must be due to school quality.

Their results indicate that, in each case, the school district that is perceived as “better” provides an increase in property values. They note that the homes in school districts with higher taxes are in fact worth more. For example, the Buckeye-Shaker neighborhood of Cleveland is divided between two different school districts, Cleveland and Shaker Heights, the latter having been nationally recognized for educational excellence. If a house in the Cleveland school district moved to the Shaker Heights school district, the house would gain approximately \$5,000 to \$12,000 in value, despite an additional \$350 to \$900 per year in taxes. The study finds similar relationships for rental rates, with a home in the Shaker Heights district renting for about \$36 per month more than its equivalent in the Cleveland school district.

In their article “School Quality and Massachusetts Enrollment Shifts in the Context of Tax Limitations,” published in the *New England Economic Review* (1998), Katharine L. Bradbury, Karl E. Case, and Christopher J. Mayer take advantage of a unique opportunity to study the effects of school funding policy on the real estate market. The study addresses the impact of Massachusetts’ Proposition 2^{1/2}, passed in the early 1990s, which limits the amount of taxes that may be levied by individual Massachusetts school districts. The authors find that since Proposition 2^{1/2} was enacted, school quality has been a significant factor driving relocation of Massachusetts residents. Although they do not quantify the monetary impact on the real estate values for each district, they imply that demand for real estate has increased in those districts not constrained by the tax limits. In other words, they find more demand for housing in those districts that had not reached the tax limit and therefore could support additional enrollment without sacrificing quality.

Surveys and Anecdotal Evidence

Recent public opinion surveys confirm the importance of public schools to home buyers. In a survey conducted by the National Association of Realtors (2002), the quality of public schools, along with the safety of the neighborhoods, were ranked as the two most important factors considered in where people choose to live. This finding is also reflected in one of the group's mottos: "Realtors don't just sell houses and buildings. We sell neighborhoods."

Anecdotal evidence also indicates that school quality is a significant factor in home buying decisions. In her 2002 article "Buying Homes, Buying Schools: School Choice and the Social Construction of School Quality," Jennifer Jellison Holme interviews parents and real estate agents about how perceptions of school quality affect home buyers' choice of location. Holme focuses on four case studies (two school districts and two individual schools) in southern California. In "good" school districts such as Rancho Vista, real estate advertisements regularly boast about the school district as a selling point to high-income buyers. A real estate agent in the Bayview district, interviewed by Holme, states that "[L]iterally 100% of the people that come from out of the [immediate area], if they have children, are coming here for the schools.' "

"Realtors don't just sell houses and buildings. We sell neighborhoods."

Conversely, according to Holme, fewer higher-income families have moved into less-admired school districts. Cloverdale Charter school, as described by Holme, illustrates both examples through its "turnaround" story. Nestled in a high income enclave of a poorer school district and municipality, Cloverdale did not become a charter school until 1993, and prior to that date many neighborhood children attended private schools rather than Cloverdale, which was then a non-charter public school. Since 1993, however, more local children have enrolled at the school, and real estate agents indicate that prices have "taken off."

Despite the evidence of a relationship between school quality and property values, Holme argues that such relationships are based on misperceptions. While acknowledging higher property values in the communities perceived to have better schools, she argues that the perception of school quality is not based upon concrete data but upon "status ideologies" communicated from one parent to another. Specifically, she argues that "high-status" parents perpetuate myths about which schools are better, while parents' real decisions are based upon racial and cultural stereotypes, particularly regarding the level of peer achievement, discipline, and violence in predominantly minority schools.

Viewpoints such as Holme's appear to assume that parents have no basis for their perceptions of quality, when in fact information such as test scores and spending per student may be readily available. Anecdotal evidence in some communities indicates that parents do have access to "concrete" information and that they use this information when making housing decisions. In a *Planning* magazine (2000) interview, relocation consultant Sheryl Theo describes home-buyer

parents in Madison, Wisconsin as well informed, arriving at her office with “test scores in hand” and asking only to see homes in the best performing school districts.

In fact, the *Planning* magazine article indicates that Madison is a good example of how an older district may overcome misperceptions about urban schools by educating prospective home buyers about school quality. In addition to providing data such as test scores, Madison is keeping up the appearances of its facilities by investing in the maintenance of older, historic school buildings. The Bradbury study, discussed above, highlights a similar approach in Brookline, Massachusetts, an older neighborhood that began renovating its older schools and constructing a new school in 1990. The authors indicate that housing prices have increased more in Brookline than in nearby Arlington, despite Brookline’s larger minority, lower-income population.

City governments also often view increasing school spending and developing innovative educational programs as a way to attract more higher-value residential development. David P. Varady and Jeffrey A. Raffle recognize this phenomenon in *Selling Cities: Attracting Homebuyers through Schools and Housing Programs* (1995). Varady and Raffle argue that improving school quality is key to attracting middle-income buyers to central cities as a prerequisite to urban revitalization. They cite the success of Cincinnati’s magnet school program as a tool for attracting middle class families back into the city.

Finally, while almost all of these studies focus on parental roles in school selection, Christian A. L. Hilber and Christopher J. Mayer conclude that even households without children will benefit from increased school expenditures (and ultimately improved school quality) in the form of increased property values. In “Why Do Households Without Children Support Local Public Schools?,” a Federal Reserve Bank of Philadelphia working paper (2002), the authors advocate increased school expenditures in highly populated areas where less land is available and thus property values are more sensitive to determinants such as school quality. Analyzing data from all fifty states, they confirm that school spending is highly supported by elderly homeowners. They theorize that these elderly citizens recognize the value of good schools to the future buyers of their homes, supported by the fact that many home buyers do have children.

...even households without children will benefit from increased school expenditures (and ultimately improved school quality) in the form of increased property values.

V. The Link Between Public School Facilities and Economic Development

The physical structures of public school facilities have their own particular impact on economic development, ranging from their construction and renovation to their locations, sizes and uses. Available research—still emerging and often reinforced by persuasive anecdotal evidence—can be divided into four key areas:

- The impact of the school construction industry itself, which is large but hard to quantify;
- The relationship between school facilities and the revitalization of distressed neighborhoods;
- The impact of small, local, community-oriented schools on economic development; and
- The impact of school facilities on student performance, and, as a result, on the economy.

A) The Impact of School Construction and Renovation

The size and impact of the K-12 construction industry are vast, but have not been well studied. According to recent estimates, the size of this industry is more than \$20 billion annually, a figure that includes the construction of new schools, additions, alterations, and modernizations (Dodge 2003, Agron 2003, Abramson 2002). Currently there are no official estimates of the jobs created by school construction, but the number is certainly large. According to projections, the industry is expected to remain strong through at least 2006 (Agron 2003).

While there is some research discussing the impact of the economy on the school construction industry, there is a dearth of data on the extent to which the industry impacts the U.S. economy (Agron 2003, Rubin, Rosta, Gonchar and Ilia 2002).

Studies are beginning to provide projections of the purported economic impact of school construction. For instance, the Economics Center for Education and Research of the University of Cincinnati (2003) released an economic impact study on Cincinnati's

planned 10-year, \$985 million school construction program. The study estimates that the construction program will have a total economic impact of over \$2.35 billion on Cincinnati's economy, including the creation of more than 2,330 jobs. The study also projects that the economic impact would occur in three main ways: the purchase of goods from local suppliers during construction; these suppliers' purchases of other goods in order to make the products needed for the construction; and the spending of incomes earned by employees of both the construction firms and the suppliers. Making such projections represents an advance in the research, but, because the actual construction program is in the early stages, it will be years before these economic impact projections can be confirmed.

Investments in school facilities can make a difference in economic outcomes.

New Jersey's 10-year school construction plan, created in 2000 by the state's Educational Facilities Construction and Financing Act, has received much attention in both the media and education communities. With a cost of \$12.3 billion, it is the largest in the state's history and "the most ambitious school-building initiative in the nation" (Bird 2000). The program includes the so-called "Abbott districts"—those districts falling below the required level of educational infrastructure improvements as established in the state Supreme Court case of *Abbott v. Burke*—and non-Abbott districts. According to the New Jersey State Labor Commissioner, as quoted in *The Bergen County Record* (2002), the state's investment in school construction "will help spur economic growth through construction and spillover jobs and the ripple effect of worker spending in our communities." Because the program is only in its initial stages, its final economic impact is still far from being determined. Furthermore, unlike in Cincinnati, precise quantitative estimates have not been undertaken of the program's projected economic impact.

A particular topic related to school construction that is receiving increasing attention in the non-academic literature is the connection between the location of new school facilities and what is viewed as costly urban sprawl (Michigan Land Institute 2004, Gurwitt 2004, U.S. Environmental Protection Agency 2003). In its report, "Hard Lessons: Causes and Consequences of Michigan's School Construction Boom," the Michigan Land Institute argues that new school construction in Michigan's outer-suburban areas has fueled harmful sprawl, and contributed to increased property taxes for homeowners and businesses and worsening schools and economic conditions for the state's older communities. Much more research is certainly needed on the long-term economic impacts of school construction across regions and states.

B) The Relationship Between School Facilities and the Revitalization of Distressed Areas

There has been particular research focusing on the impact that public school facilities can have on the economic development of their surrounding neighborhoods, particularly in distressed areas. This literature builds on and is consistent with the strong research already discussed linking perceived school quality with residential real estate values. The evidence suggests that poorly maintained, overcrowded facilities contribute to neighborhood decline, while new or well-maintained facilities help revitalize a neighborhood (Spector 2003, National Association of Realtors 2002, Byron, Exter and Mediratta 2001, Bird 2000, Mooney 2000, Veenendaal and van Wijk 1991). In Alice Veenendaal and Teun van Wijk's study "The Role of Educational Building in Urban Renewal" conducted for the Organisation for Economic Cooperation and Development (1991), the authors look at schools in several developed nations outside the U.S. They find that a "lack of good [secondary] schools [defined as new or well-maintained] can lead to decline and stigmatization, inevitably resulting in migration out of the neighbourhood."

...new or well-maintained facilities help revitalize a neighborhood

The National Association of Realtors (NAR) explicitly recognizes public school facilities' key role in community economic revitalization in its study (prepared with the Local Government Commission), "New Schools for Older Neighborhoods" (2002). This report is especially significant given realtors' direct involvement with, and financial interest in, local economic development. It concludes, "More and more community leaders are recognizing the power of schools to attract and keep residents in a neighborhood. Leaders in many urban communities are building or renovating schools as part of broader strategies for revitalizing blighted areas." The study does not offer economic analysis but highlights particularly successful newly constructed or renovated schools that have helped the development of their neighborhoods. For example:

- In Pomona, California, a primary school and a high school were located in an old strip mall to "help jump-start other neighborhood revitalization efforts." As a result, what was once a dying neighborhood now boasts a new transit center, performing arts center, housing, new commercial properties, investment in new infrastructure, and a general decrease in crime.
- In Philadelphia, the University of Pennsylvania entered into a partnership with the city in 1998 to help fund the Penn-Assisted School, serving grades pre-K to 8 and designed for about 700 students. The NAR study quotes the *Philadelphia Daily News* as reporting that it created a "mad scramble for homes in the surrounding neighborhood." However, despite the media attention the school has received, there have not yet been any academic studies on the school's impact on the neighborhood.
- In Chattanooga, Tennessee, the Hamilton County School District, working with local partners, built two downtown K-5 magnet schools as part of the city's efforts to revitalize the neighborhood and encourage people to live in the city's center. Though the schools are available to students from other neighborhoods, priority is given to downtown residents. Since the publication of the NAR study, the schools were opened in August 2002. Although no formal studies have been conducted, it seems clear that the schools have already made a positive economic impact on the downtown.

New Jersey's construction plan, already noted, includes school construction in the Abbott districts, whose schools are in many of the state's most economically depressed neighborhoods. The goal of the program is to revitalize these neighborhoods, and "leverag[e] economic development in areas that have been left behind." (Bird 2000). The "school renaissance zones" designating the neighborhoods slated for new school construction will "use the schools to attract housing and community uses into the mostly abandoned neighborhood[s]," reports John Mooney in the *Newark Star-Ledger* (2003). One such place is Trenton, where the state is planning to construct

three schools at a former factory site to help revitalize the surrounding area.

Articles in planning magazines have noted other successful projects. In Oklahoma City, the renovation and reopening of Cleveland Elementary School led to a 30 to 100 percent increase in property values, according to Karen Finucan in “Location, Location, Location” in *Planning* magazine (2000). A new high school, replacing two worn-down high schools in a downtrodden area of Niagara Falls, New York, helped “breathe new life into the community,” notes Thomas Dolan in “School as the Heart of the Community” in *School Planning & Management* (2001). Private financing helped fund the project, reflecting the private sector’s growing recognition that new facilities can help spur economic development.

C) The Impact of Small, Local, Community-Oriented Schools

The size, shape and form of school facilities, along with their physical connection to the surrounding community, is an area of increasing interest for researchers. There is some evidence that small, local schools can contribute toward the academic achievement of students, particularly in low-income areas (Toch 2003, Lyson 2002, Reynolds 2002, Dunn 2001, Pearson 2001, Bickel and Howley 2000, Boethel 2000, Drabenstott 2000, Annenberg Rural Challenge 2000, Collins 1999, Southwest Education Development Laboratory 1999, Salant and Waller 1998). In turn, as discussed in Section II, academic achievement translates into increased earning power and economic growth. There is also evidence that small, local schools, especially in rural areas, can contribute directly to local economic development (Lyson 2002, Salant and Waller 1998, et al). A particular way that schools can make an economic contribution is through sharing or co-locating their facilities with the community (Pearson 2001, et al).

Small, Local Schools

Much of the literature discussing the importance of small, local schools is in the context of rural areas (Wolfshohl 2003, Lyson 2002, Reynolds 2002, Dunn 2001, Pearson 2001, Boethel 2000, Drabenstott 2000, Annenberg Rural Challenge 2000, Collins 1999, Southwest Education Development Laboratory 1999, Salant and Waller 1998). This work developed in part as a response to the threat of consolidating rural schools and districts.

Priscilla Salant and Anita Waller capture the beginnings of this trend in their 1998 literature review, “What Difference Do Local Schools Make?” prepared for The Rural School and Community Trust. They find three studies (Sederberg 1987, Petkovich and Ching 1977, and Dreier 1982) investigating the link between local schools and economic development in rural communities—with two of the three demonstrating such a linkage. Sederberg describes the local school as a major employer, constituting 4 to 9 percent of the county payroll and 1 to 5 percent of

Rural towns with local public schools are often more economically advanced.

all employed people in the county. He also finds that salaries earned by school employees accounted for 5 to 10 percent of retail sales. Petkovitch and Ching determine that high school students also impacted economic development by their employment in local after-school jobs and spending in local stores. Dreier claims there is no economic impact on a community when a school closes, though Slant and Waller challenge Dreier's "small sample size and questionable methodology."

More recently, Thomas Lyson's study in the *Journal of Research in Rural Education*, "What Does a School Mean to a Community?" (2002) concludes that rural towns with local public schools are often more economically advanced, with more people employed in professional, managerial, and executive occupations. However, at times consolidation can be unavoidable due, for instance, to a lack of funding for rural schools. Karl Wolfshohl notes this situation in his article "A Rural School That Works" in *Progressive Farmer* (2003), highlighting the Boone County, Nebraska school district as successfully mitigating the negative local economic impact of consolidation. When that district was formed by consolidating the school districts of two small towns, the new district left elementary schools in each town. It then placed the middle school in one of the towns and the high school in the other, ensuring that neither town lost all of its local schools. Because each town retained a local school, the positive economic impact of local schools was preserved.

Smaller schools also narrow the "achievement gap" between students from affluent communities and those from poorer communities.

Though school size is still generally increasing, current research indicates that smaller schools can provide students with a better education than larger schools, particularly for poorer students (Lawrence, et al 2002, Bickel and Howley 2000, Bickel 1999a, Bickel 1999b, Howley 1999a, Howley 1999b, Howley 1996, Huang

and Howley 1993, Friedkin and Necochea 1988). Small schools generally outperform large schools, with higher graduation rates and more students continuing their education post-graduation (Lawrence, et al 2002, Stiefel, Berne, Iatarola, and Fruchter 2000, Khattari, Mik, and Flynn 1996).

Craig Howley and Robert Bickel's study of 13,600 schools in 2,290 districts, "The Influence of Scale on School Performance" for The Rural School and Community Trust (2000), concludes that small schools, in a range of environments, reduce the impact of poverty on educational achievement and that the performance of low-income students declines in larger schools. Smaller schools also narrow the "achievement gap" between students from affluent communities and those from poorer communities. Howley and Bickel note, however, that in affluent communities student performance can actually increase in larger schools.

Urban school facilities have received particular attention in California. The California-based New Schools Better Neighborhoods (NSBN) civic advocacy organization sets forth its vision for the state's urban school districts in its publication "What If?" (1999). The report notes the importance of small, local schools for the economic well-being of communities. The National Neighborhood Coalition in its report "Smart Growth, Better Neighborhoods: Communities Leading the Way"

(2000) discusses these concerns in the context of Los Angeles, a city experiencing a drastic school shortage. The district was bussing many children for over an hour to distant schools, “limiting the ability of parents to meet with teachers and students to participate in school activities, adversely affecting the quality of the education they receive.” The Coalition reports that, with neighborhood-based schools, students would be more likely to participate in extra-curricular activities, and notes further that students involved in school activities are more likely to be high performers.

In response to such concerns, the Los Angeles Unified School District is currently undertaking a multi-billion dollar construction program. The construction program is expected to build 79 new schools and expand 80 others in the next several years (Los Angeles Unified School District 2003). A report by NSBN, “A New Strategy for Building Better Neighborhoods,” (2002) makes the case that, with communities as part of the process, this program can be a “linchpin to greater economic development and a tremendous redevelopment opportunity . . .” Quantitative projections of the potential economic impact have not yet been undertaken.

Sharing Facilities with Communities

Along with the movement for smaller schools has been a movement to encourage schools to share their facilities with the community, providing the community with more resources and space for its programs (Coalition for Community Schools 2003, Rittner-Heir 2003, Dolan 2001, Pearson 2001, Bird 2000, Veendendaal and van Wijk 1991). The Coalition for Community Schools offers the following definition for a community school, “Using public schools as a hub, community schools bring together many partners to offer a range of supports and opportunities to children, youth, families, and communities – before, during, and after school, seven days a week.”

In an *Architectural Record* article entitled “Educators and Architects are Rethinking Large, Generic Schools that are Separated from Their Community” (2001), Clifford Pearson highlights a few schools that have positively impacted their surrounding community through sharing or co-locating school facilities. In Pomona, California, the previously mentioned school located in a shopping center, shares the premises with a Kinko’s copy shop and a drug store. At the San Francisco Tenderloin District’s elementary school, the school’s facilities house medical and dental clinics, a family counseling center, adult education programs, a community garden, a community kitchen, and a preschool. As discussed, using facilities for adult education in particular can benefit the economy when people take this training into the workforce.

D) The Impact of Well-Maintained Schools on Student Performance

Just as studies indicate that small schools often inspire higher student performance, recent research similarly supports the idea that well-maintained school facilities boost student performance (Schneider 2002a and 2002b, Anderson 1999, Earthman and Lemasters 1998, Philips 1997). As we have seen, a rise in student performance has a positive impact on surrounding residential real estate values. New, renovated, and well-maintained schools can serve as an investment in the human capital of students, which also enhances economic growth.

Well-maintained school facilities boost student performance.

Mark Schneider's report for the National Clearinghouse for Educational Facilities asks in its title "Do School Facilities Affect Academic Outcomes?" (2002a). Answering in the affirmative, Schneider reviews the existing literature on the topic and finds that, while measurement difficulties exist, there is an emerging consensus among researchers that the condition of school facilities affects academic achievement, as indicated by higher student scores on standardized tests. In exploring the characteristics of a school's physical structure that potentially impact student performance, he considers such factors as indoor air quality, ventilation, and thermal comfort, lighting, acoustics, and building age and quality.

Citing past studies and anecdotal evidence, he finds that poor indoor air quality and ventilation can cause a variety of illnesses, increasing student absenteeism (Environmental Protection Agency 2000, Rosen and Richardson 1999, General Accounting Office 1995), and that poor ventilation, thermal discomfort, poor acoustics, and artificial lighting can also be obstacles to a student's concentration (Lackney 1999, Harner 1974, Wyon, Andersen and Lundqvist 1979). A building's quality also projects an image of the school's value, and a poorly maintained school can discourage students from striving for high performance (Byron, Exeter and Mediratta 2001, Finucan 2000). Schneider finds that a building's "age itself should not be used as an indicator of a facility's impact on student performance," as older buildings can be modernized. His review of the literature leads Schneider to note that much more research is needed regarding which "specific facility attributes affect academic outcomes the most."

In another study of school facilities, "Public School Facilities and Teaching: Washington, D.C. and Chicago" carried out for the Neighborhood Capital Budget Group (2002b), Schneider reports the results of interviews with 688 teachers in Chicago, and of a survey sent to all teachers in Washington D.C. and returned by 25 percent. He finds that over 40 percent of Washington teachers and over 20 percent of Chicago teachers believe that their school facilities are inadequate. Comparing the data on facilities with test scores and using a simple model that controlled statistically for other factors (such as demographics and income), he concludes that better facilities can improve the percentage of students performing at or above grade level by 3 to 4 percent and that "improving facilities may be just as helpful as reducing class size." Such findings certainly suggest that well-maintained facilities can improve academic performance and can lead to economic development.

VI. Conclusion

The literature reveals a number of ways that public schools impact economic development, though much more research needs to be done in order to clarify and quantify this impact. On the national level, there is convincing research showing that public schools have a profound effect on national economic growth, by influencing the quantity and quality of education. “Human capital” theory documents that investment in the skill level of a nation’s population translates into increased national productivity. Education also leads to higher wages and greater social opportunity.

While the research is emerging and difficult to measure, many studies have shown that public schools and school spending also impact state and local economies and can play a role in attracting business. By educating the future workforce, public schools help make states and localities more economically competitive. In addition, as a basic industry, schools are major employers that have a short-term stimulus impact on state and local economies. Evidence suggests that the quality of public schools can also influence business site selection and labor location decisions.

In one aspect of local development, there is clear-cut, undisputed evidence: the quality of public schools directly influences residential property values. Homes in higher-performing school districts sell for higher prices than homes in lower-performing school districts. Studies only differ on which exact factors contribute to measuring school quality. The conclusion that schools affect real estate value is also strongly supported by anecdotal evidence.

Finally, there is some emerging evidence that the quality, size, and shape of the school facilities themselves, along with the construction and renovation of those facilities, impact economic development. Facilities that are small, local, and community-oriented can have a particularly positive effect on local development, especially in economically distressed areas. Research also indicates that well-maintained facilities enhance academic performance which, based on the evidence above, enhances economic growth.

Going From Here

The overall subject of the impact of public schools on economic development, as well as the various subtopics, offers a rich area for researchers to mine. More research, especially quantitative but also qualitative, is needed, along with an emphasis on integrating various topics and approaches.

On the national level, while research on the impacts of education is quite robust, additional inquiry into the overall impact of public schools as an industry is important. Such work could include estimates of the number of people employed by public schools, both directly and indirectly through industries such as school construction.

Assessing the state and local level economic impacts of public education presents more difficult challenges to researchers, and much more comprehensive research, such as state-by-state economic impact studies, is needed. States and localities undertaking school construction and renovation programs should conduct economic impact studies, as was done in Cincinnati. These studies ought to become more refined over time as more experience is gained. One topic deserving of careful study is how school construction in newly developing areas on the urban fringe may impact the economy of older areas. A truly comprehensive national study on how public education influences business and worker location decisions also needs to be conducted.

While the research strongly shows how quality schools raise real estate values, more research is needed to link to broader issues, such as urban revitalization in general. Also, how good schools help maintain neighborhood stability over the long-term should be explored. At the present time, there is much anecdotal evidence on the role that school facilities play in urban revitalization efforts. One compelling question is how renovated schools have actually raised real estate values and contributed to the economic well-being of longtime residents.

Of course, as noted in the paper, many other questions abound. As advocates increasingly tout the economic benefits of public schools, it is critical that researchers address such issues further. Deeper and broader analysis focusing on the interconnectedness of the economic benefits of education will provide a firm, factual foundation for meaningful public policy discussion and community decision-making. Education is too important to deserve anything less.

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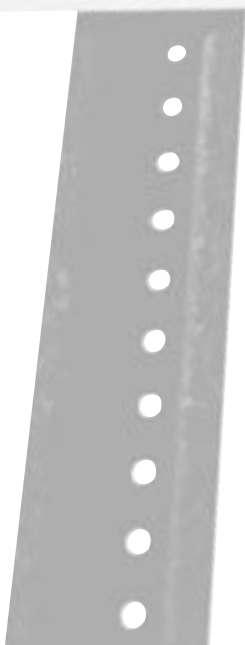
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