



Human Capital

by Gary S. Becker

To most people, capital means a bank account, a hundred shares of IBM stock, assembly lines, or steel plants in the Chicago area. These are all forms of capital in the sense that they are assets that yield income and other useful outputs over long periods of time.

But such tangible forms of capital are not the only type of capital. Schooling, a computer training course, expenditures on medical care, and lectures on the virtues of punctuality and honesty are also capital. That is because they raise earnings, improve health, or add to a person's good habits over much of his lifetime. Therefore, economists regard expenditures on **education**, training, medical care, and so on as investments in human capital. They are called human capital because people cannot be separated from their knowledge, skills, health, or values in the way they can be separated from their financial and physical assets.

Education, training, and health are the most important investments in human capital. Many studies have shown that high school and college education in the United States greatly raise a person's income, even after netting out direct and indirect costs of schooling, and even after adjusting for the fact that people with more education tend to have higher IQs and better-educated, richer parents. Similar evidence covering many years is now available from more than a hundred countries with different cultures and economic systems. The earnings of more-educated people are almost always well above average, although the gains are generally larger in less-developed countries.

Consider the differences in average earnings between college and high school graduates in the United States during the past fifty years. Until the early 1960s, college graduates earned about 45 percent more than high school graduates. In the 1960s, this premium from college education shot up to almost 60 percent, but it fell back in the 1970s to less than 50 percent. The fall during the 1970s led some economists and the media to worry about "overeducated Americans." Indeed, in 1976, Harvard economist Richard Freeman wrote a book titled *The Overeducated American*. This sharp fall in the return to investments caused doubt about whether education and training really do raise productivity or simply provide signals ("credentials") about talents and abilities.

But the monetary gains from a college education rose sharply again during the 1980s, to the highest level since the 1930s. Economists Kevin M. Murphy and Finis Welch have shown that the premium on getting a college education in the 1980s was above 65 percent. This premium continued to rise in the 1990s, and in 1997 it was more than 75 percent. Lawyers, accountants, engineers, and many other professionals experienced especially rapid advances in earnings. The earnings advantage of high school graduates over high school dropouts has also greatly increased. Talk about overeducated Americans has vanished, replaced by concern about whether the United States provides adequate quality and quantity of education and other training.

This concern is justified. Real wage rates of young high school dropouts have fallen by more than 25 percent since the early 1970s. This drop is overstated, though, because the **inflation** measure used to compute real wages overstates the amount of inflation over that time (Real wages for high school dropouts stayed constant from 1995 to 2004, which means, given the price index used to adjust them, that these wages have increased somewhat).

Thinking about higher education as an **investment** in human capital helps us understand why the fraction of high school graduates who go to college increases and decreases from time to time. When the benefits of a college degree fell in the 1970s, for example, the fraction of white high school graduates who started college fell—from 51 percent in 1970 to 46 percent in 1975. Many educators expected that enrollments would continue to decline in the 1980s, partly because the number of eighteen-year-olds was declining, but also because college tuition was rising rapidly. They were wrong about whites. The fraction of white high school graduates who entered college rose steadily in the 1980s, reaching 60 percent in 1988, and caused an absolute increase in the number of whites enrolling despite the smaller number of college-aged people. That percentage kept increasing to an all-time high of 67 percent in 1997 and then declined slightly to 64 percent in 2000.

This makes sense. The benefits of a college education, as noted, increased in the 1980s and 1990s. Tuition and fees did rise by about 39 percent from 1980 to 1986, and by 20 percent more from 1989 to 2000 in real, inflation-adjusted terms (again, using the faulty price indexes available). But tuition and fees are not, for most college students, the major cost of going to college. On average, three-fourths of the private cost of a college education—the cost borne by the student and the student's family—is the income that college students give up by not working. A good measure of this "**opportunity cost**" is the income that a newly minted high school graduate could earn by working full time. During the 1980s and 1990s, this forgone income rose only about 4 percent in real terms. Therefore, even a 67 percent increase in real tuition costs in twenty years translated into an increase of just 20 percent in the average student's total cost of a college education.

The economics of human capital also account for the fall in the fraction of black high school graduates who went on to college in the early 1980s. As UCLA economist Thomas J. Kane has pointed out, costs rose more for black college students than for whites. That is because a higher percentage of blacks are from low-income families, and therefore had been heavily subsidized by the federal government. Cuts in federal grants to them in the early 1980s substantially raised their cost of a college education. In the 1990s, however, there was a substantial recovery in the percentage of black high school graduates going on to college.

According to the 1982 “Report of the Commission on Graduate Education” at the University of Chicago, demo-graphic-based college enrollment forecasts had been wide of the mark during the twenty years prior to that time. This is not surprising to a “human capitalist.” Such forecasts ignored the changing incentives—on the cost side and on the benefit side—to enroll in college.

The economics of human capital have brought about a particularly dramatic change in the incentives for women to invest in college education in recent decades. Prior to the 1960s, American women were more likely than men to graduate from high school, but less likely to go to college. Women who did go to college shunned or were excluded from math, sciences, economics, and law, and gravitated toward teaching, home economics, foreign languages, and literature. Because relatively few married women continued to work for pay, they rationally chose an education that helped in “household production”—and no doubt also in the marriage market—by improving their social skills and cultural interests.

All this has changed radically. The enormous increase in the labor participation of married women is the most important labor force change during the past twenty-five years. Many women now take little time off from their jobs, even to have children. As a result, the value to women of market skills has increased enormously, and they are bypassing traditional “women’s” fields to enter accounting, law, medicine, engineering, and other subjects that pay well. Indeed, women now constitute about one-third of enrollments in business schools, more than 45 percent in law schools, and more than 50 percent in medical schools. Many home economics departments have either shut down or are emphasizing the “new home economics”—that is, the economics of whether to get married, how many children to have, and how to allocate household resources, especially time. Improvements in the economic position of black women have been especially rapid, and black women now earn almost as much as white women.

Of course, formal education is not the only way to invest in human capital. Workers also learn and are trained outside schools, especially on the job. Even college graduates are not fully prepared for the labor market when they leave school and must be fitted into their jobs through formal and informal training programs. The amount of on-the-job training ranges from an hour or so at simple jobs like dishwashing to several years at complicated tasks like engineering in an auto plant. The limited data available indicate that on-the-job training is an important source of the very large increase in earnings that workers get as they gain greater experience at work. Bold estimates by Columbia University economist Jacob Mincer suggest that the total investment in on-the-job training may be well above \$200 billion a year, or about 2 percent of GDP.

No discussion of human capital can omit the influence of families on the knowledge, skills, health, values, and habits of their children. Parents affect educational attainment, marital stability, propensities to smoke and to get to work on time, and many other dimensions of their children’s lives.

The enormous influence of the family would seem to imply a very close relation between the earnings, education, and occupations of parents and children. Therefore, it is rather surprising that the positive relation between the earnings of parents and children is not so strong, although the relation between the years of schooling of parents and their children is stronger. For example, if fathers earn 20 percent above the mean of their generation, sons at similar ages tend to earn about 8-10 percent above the mean of theirs. Similar relations hold in Western European countries, **Japan**, Taiwan, and many other places. Statisticians and economists call this “regression to the mean.”

The old adage of “from shirtsleeves to shirtsleeves in three generations” (the idea being that someone starts with hard work and then creates a fortune for the next generation that is then dissipated by the third generation) is no myth; the earnings of grandsons and grandparents at comparable ages are not closely related. Apparently, the opportunities provided by a modern economy, along with extensive government and charitable support of education, enable the majority of those who come from lower-income backgrounds to do reasonably well in the labor market. The same opportunities that foster upward mobility for the poor create an equal amount of downward mobility for those higher up on the income ladder.

The continuing growth in per capita incomes of many countries during the nineteenth and twentieth centuries is partly due to the expansion of scientific and technical knowledge that raises the productivity of labor and other inputs in production. And the increasing reliance of industry on sophisticated knowledge greatly enhances the value of education, technical schooling, on-the-job training, and other human capital.

New technological advances clearly are of little value to countries that have very few skilled workers who know how to use them. **Economic growth** closely depends on the synergies between new knowledge and human capital, which is why large increases in education and training have accompanied major advances in technological knowledge in all countries that have achieved significant economic growth.

The outstanding economic records of Japan, Taiwan, and other Asian economies in recent decades dramatically illustrate the importance of human capital to growth. Lacking **natural resources**—they import almost all their **energy**, for example—and facing **discrimination** against their exports by the West, these so-called Asian tigers grew rapidly by relying on a well-trained, educated, hardworking, and conscientious labor force that makes excellent use of modern technologies. China, for example, is progressing rapidly by mainly relying on its abundant, hardworking, and ambitious **population**.

About the Author

Gary S. Becker is university professor of economics and sociology at the University of Chicago, a professor at the Graduate School of Business, and the Rose-Marie and Jack R. Anderson Senior Fellow at Stanford’s Hoover Institution. He was a pioneer in the study of human capital and was awarded the 1992 Nobel Memorial Prize in Economic Sciences