

CHAPTER 6

Productivity and Human Capital:

Why is Bill Gates so much richer than you are?

Like many people, Bill Gates found his house a little cramped once he had children. The software mogul moved into his \$100 million dollar mansion in 1997; not long after, it needed some tweaking. The 37,000-square-foot home has a twenty-seat theater, a reception hall, parking for twenty-eight cars, an indoor trampoline pit, and all kinds of computer gadgetry, such as phones that ring only when the person being called is nearby. But the house was not quite big enough.¹ According to documents filed with the zoning board in suburban Medina, Washington, Mr. Gates and his wife added another bedroom and some additional play and study areas for their children.

There are a lot of things one might infer from Mr. Gates's home addition, but one of them is fairly obvious: It is good to be Bill Gates. The world is a fascinating playground when you have \$50 billion or so. One might also ponder some larger questions: Why do some people have indoor trampolines and private jets while others sleep in bus station bathrooms? How is it that roughly 13 percent of Americans are poor, which is an improvement from a recent peak of 15 percent in 1993 but not significantly better than it was during any year in the 1970s? Meanwhile, one in five American children—and a staggering

35 percent of black children—live in poverty. Of course, America is the rich guy on the block. At the dawn of the third millennium, vast swathes of the world's population—some three billion people—are desperately poor.

Economists study poverty and income inequality. They seek to understand who is poor, why they are poor, and what can be done about it. Any discussion of why Bill Gates is so much richer than the men and women sleeping in steam tunnels must begin with a concept economists refer to as human capital. Human capital is the sum total of skills embodied within an individual: education, intelligence, charisma, creativity, work experience, entrepreneurial vigor, even the ability to throw a baseball fast. It is what you would be left with if someone stripped away all of your assets—your job, your money, your home, your possessions—and left you on a street corner with only the clothes on your back. How would Bill Gates fare in such a situation? Very well. Even if his wealth were confiscated, other companies would snap him up as a consultant, a board member, a CEO, a motivational speaker. (When Steve Jobs was fired from Apple, the company that he founded, he turned around and founded Pixar; only later did Apple invite him back.) How would Tiger Woods do? Just fine. If someone lent him golf clubs, he could be winning a tournament by the weekend.

How would Bubba, who dropped out of school in tenth grade and has a methamphetamine addiction, fare? Not so well. The difference is human capital; Bubba doesn't have much. (Ironically, some very rich individuals, such as the sultan of Brunei, might not do particularly well in this exercise either; the sultan is rich because his kingdom sits atop an enormous oil reserve.) The labor market is no different from the market for anything else; some kinds of talent are in greater demand than others. The more nearly unique a set of skills, the better compensated their owner will be. Alex Rodriguez will earn \$275 million over ten years playing baseball for the New York Yankees because he can hit a round ball traveling ninety-plus miles an hour harder and more often than other people can. "A-Rod" will help the Yankees win games, which will

fill stadiums, sell merchandise, and earn television revenues. Virtually no one else on the planet can do that as well as he can.

As with other aspects of the market economy, the price of a certain skill bears no inherent relation to its social value, only its scarcity. I once interviewed Robert Solow, winner of the 1987 Nobel Prize in Economics and a noted baseball enthusiast. I asked if it bothered him that he received less money for winning the Nobel Prize than Roger Clemens, who was pitching for the Red Sox at the time, earned in a single season. "No," Solow said. "There are a lot of good economists, but there is only one Roger Clemens." That is how economists think.

Who is wealthy in America, or at least comfortable? Software programmers, hand surgeons, nuclear engineers, writers, accountants, bankers, teachers. Sometimes these individuals have natural talent; more often they have acquired their skills through specialized training and education. In other words, they have made significant investments in human capital. Like any other kind of investment—from building a manufacturing plant to buying a bond—money invested today in human capital will yield a return in the future. A very good return. A college education is reckoned to yield about a 10 percent return on investment, meaning that if you put down money today for college tuition, you can expect to earn that money back plus about 10 percent a year in higher earnings. Few people on Wall Street make better investments than that on a regular basis.

Human capital is an economic passport—literally, in some cases. When I was an undergraduate in the late 1980s, I met a young Palestinian man named Gamal Abouali. Gamal's family, who lived in Kuwait, were insistent that their son finish his degree in three years instead of four. This required taking extra classes each quarter and attending school every summer, all of which seemed rather extreme to me at the time. What about internships and foreign study, or even a winter in Colorado as a ski bum? I had lunch with Gamal's father once, and he explained that the Palestinian existence was itinerant and precarious. Mr. Abouali was an accountant, a profession that he could practice nearly anywhere

in the world—because, he explained, that is where he might end up. The family had lived in Canada before moving to Kuwait; they could easily be somewhere else in five years, he said.

Gamal was studying engineering, a similarly universal skill. The sooner he had his degree, his father insisted, the more secure he would be. Not only would the degree allow him to earn a living, but it might also enable him to find a home. In some developed countries, the right to immigrate is based on skills and education—human capital.

Mr. Abouali's thoughts were strikingly prescient. After Saddam Hussein's retreat from Kuwait in 1990, most of the Palestinian population, including Gamal's family, was expelled because the Kuwaiti government felt that the Palestinians had been sympathetic to the Iraqi aggressors. Mr. Abouali's daughter gave him a copy of the first edition of this book. When he read the above section, he exclaimed, "See, I was right!"

The opposite is true at the other end of the labor pool. The skills necessary to ask "Would you like fries with that?" are not scarce. There are probably 150 million people in America capable of selling value meals at McDonald's. Fast-food restaurants need only pay a wage high enough to put warm bodies behind all of their cash registers. That may be \$7.25 an hour when the economy is slow or \$11 an hour when the labor market is especially tight; it will never be \$500 an hour, which is the kind of fee that a top trial lawyer can command. Excellent trial lawyers are scarce; burger flippers are not. The most insightful way to think about poverty, in this country or anywhere else in the world, is as a dearth of human capital. True, people are poor in America because they cannot find good jobs. But that is the symptom, not the illness. The underlying problem is a lack of skills, or human capital. The poverty rate for high school dropouts in America is 12 times the poverty rate for college graduates. Why is India one of the poorest countries in the world? Primarily because 35 percent of the population is illiterate (down from almost 50 percent in the early 1990s).² Or

individuals may suffer from conditions that render their human capital less useful. A high proportion of America's homeless population suffers from substance abuse, disability, or mental illness.

A healthy economy matters, too. It was easier to find a job in 2001 than it was in 1975 or 1932. A rising tide does indeed lift all boats; economic growth is a very good thing for poor people. Period. But even at high tide, low-skilled workers are clinging to driftwood while their better-skilled peers are having cocktails on their yachts. A robust economy does not transform valet parking attendants into college professors. Investments in human capital do that. Macroeconomic factors control the tides; human capital determines the quality of the boat. Conversely, a bad economy is usually most devastating for workers at the shallow end of the labor pool.

Consider this thought experiment. Imagine that on some Monday morning we dropped off 100,000 high school dropouts on the corner of State Street and Madison Street in Chicago. It would be a social calamity. Government services would be stretched to capacity or beyond; crime would go up. Businesses would be deterred from locating in downtown Chicago. Politicians would plead for help from the state or the federal government: *Either give us enough money to support these people or help us get rid of them.* When business leaders in Sacramento, California, decided to crack down on the homeless, one strategy was to offer them one-way bus tickets out of town.³ (Atlanta reportedly did the same before the 1996 Olympics.)

Now imagine the same corner and let's drop off 100,000 graduates from America's top universities. The buses arrive at the corner of State and Madison and begin unloading lawyers, doctors, artists, geneticists, software engineers, and a lot of smart, motivated people with general skills. Many of these individuals would find jobs immediately. (Remember, human capital embodies not only classroom training but also perseverance, honesty, creativity—virtues that lend themselves to finding work.) Some of these highly skilled graduates would start their own businesses; entrepreneurial flair is certainly an important com-

ponent of human capital. Some of them would leave for other places; highly skilled workers are more mobile than their low-skilled peers. In some cases, firms would relocate to Chicago or open up offices and plants in Chicago to take advantage of this temporary glut of talent. Economic pundits would later describe this freak unloading of buses as a boon for Chicago's economic development, much as waves of immigration helped America to develop.

If this example sounds contrived, consider the case of the Naval Air Warfare Center (NAWC) in Indianapolis, a facility that produced advanced electronics for the navy until the late 1990s. NAWC, which employed roughly 2,600 workers, was slated to be closed as part of the military's downsizing. We're all familiar with these plant-closing stories. Hundreds or thousands of workers lose their jobs; businesses in the surrounding community begin to wither because so much purchasing power has been lost. Someone comes on camera and says, "When the plant closed back in [some year], this town just began to die." But NAWC was a very different story.⁴ One of its most valuable assets was its workforce, some 40 percent of whom were scientists or engineers. Astute local leaders, led by Mayor Stephen Goldsmith, believed that the plant could be sold to a private buyer. Seven companies filed bids; Hughes Electronics was the winner.

On a Friday in January 1997, the NAWC employees went home as government employees; the following Monday, 98 percent of them came to work as Hughes employees. (And NAWC became HAWC.) The Hughes executives I interviewed said that the value of the acquisition lay in the people, not just the bricks and mortar. Hughes was buying a massive amount of human capital that it could not easily find anywhere else. This story contrasts sharply with the plant closings that Bruce Springsteen sings about, where workers with limited education find that their narrow sets of skills have no value once the mill/mine/factory/plant is gone. The difference is human capital. Indeed, economists can even provide empirical support for those Springsteen songs. Labor economist Robert Topel has estimated that experienced

workers lose 25 percent of their earnings capacity in the long run when they are forced to change jobs by a plant closing.

Now is an appropriate time to dispatch one of the most pernicious notions in public policy: the lump of labor fallacy. This is the mistaken belief that there is a fixed amount of work to be done in the economy, and therefore every new job must come at the expense of a job lost somewhere else. If I am unemployed, the mistaken argument goes, then I will find work only if someone else works less, or not at all. This is how the French government used to believe the world worked, and it is wrong. Jobs are created anytime an individual provides a new good or service, or finds a better (or cheaper) way of providing an old one.

The numbers prove the point. The U.S. economy produced tens of millions of new jobs over the past three decades, including virtually the entire Internet sector. (Yes, the recession that began in 2007 destroyed lots of jobs, too.) Millions of women entered the labor force in the second half of the twentieth century, yet our unemployment rate was still extremely low by historical standards until the beginning of the recent downturn. Similarly, huge waves of immigrants have come to work in America throughout our history without any long-run increase in unemployment. Are there short-term displacements? Absolutely; some workers lose jobs or see their wages depressed when they are forced to compete with new entrants to the labor force. But more jobs are created than lost. Remember, new workers must spend their earnings elsewhere in the economy, creating new demand for other products. The economic pie gets bigger, not merely resliced.

Here is the intuition: Imagine a farming community in which numerous families own and farm their own land. Each family produces just enough to feed itself; there is no surplus harvest or unfarmed land. Everyone in this town has enough to eat; on the other hand, no one lives particularly well. Every family spends large amounts of time doing domestic chores. They make their own clothes, teach their own children, make and repair their own farm implements, etc. Suppose a guy wanders into town looking for work. In scenario one, this guy has

no skills. There is no extra land to farm, so the community tells him to get back on the train. Maybe they even buy him a one-way ticket out of town. This town has “no jobs.”

Now consider scenario two: The guy who ambles into town has a Ph.D. in agronomy. He has designed a new kind of plow that improves corn yields. He trades his plow to farmers in exchange for a small share of their harvests. Everybody is better off. The agronomist can support himself; the farmers have more to eat, even after paying for their new plows (or else they wouldn't buy the plows). And this community has just created one new job: plow salesman. Soon thereafter, a carpenter arrives at the train station. He offers to do all the odd jobs that limit the amount of time farmers can spend tending to their crops. Yields go up again because farmers are able to spend more time doing what they do best: farming. And another new job is created.

At this point, farmers are growing more than they can possibly eat themselves, so they “spend” their surplus to recruit a teacher to town. That's another new job. She teaches the children in the town, making the next generation of farmers better educated and more productive than their parents. Over time, our contrived farming town, which had “no jobs” at the beginning of this exercise, has romance novelists, firefighters, professional baseball players, and even engineers who design iPhones and Margarita Space Paks. This is the one-page economic history of the United States. Rising levels of human capital enabled an agrarian nation to evolve into places as rich and complex as Manhattan and Silicon Valley.

Not all is rosy along the way, of course. Suppose one of our newly educated farmers designs a plow that produces even better yields, putting the first plow salesman out of business—creative destruction. True, this technological breakthrough eliminates one job in the short run. In the long run, though, the town is still better off. Remember, all the farmers are now richer (as measured by higher corn yields), enabling them to hire the unemployed agronomist to do something else, such as develop new hybrid seeds (which will make the town richer yet).

Technology displaces workers in the short run but does not lead to mass unemployment in the long run. Rather, we become richer, which creates demand for new jobs elsewhere in the economy. Of course, educated workers fare much better than uneducated workers in this process. They are more versatile in a fast-changing economy, making them more likely to be left standing after a bout of creative destruction.

Human capital is about much more than earning more money. It makes us better parents, more informed voters, more appreciative of art and culture, more able to enjoy the fruits of life. It can make us healthier because we eat better and exercise more. (Meanwhile, good health is an important component of human capital.) Educated parents are more likely to put their children in car seats and teach them about colors and letters before they begin school. In the developing world, the impact of human capital can be even more profound. Economists have found that a year of additional schooling for a woman in a low-income country is associated with a 5 to 10 percent reduction in her child's likelihood of dying in the first five years of life.⁵

Similarly, our total stock of human capital—everything we know as a people—defines how well off we are as a society. We benefit from the fact that we know how to prevent polio or make stainless steel—even if virtually no one reading this book would be able to do either of those things if left stranded on a deserted island. Economist Gary Becker, who was awarded the Nobel Prize for his work in the field of human capital, reckons that the stock of education, training, skills, and even the health of people constitutes about 75 percent of the wealth of a modern economy. Not diamonds, buildings, oil, or fancy purses—but things that we carry around in our heads. “We should really call our economy a ‘human capitalist economy,’ for that is what it mainly is,” Mr. Becker said in a speech. “While all forms of capital—physical capital, such as machinery and plants, financial capital, and human capital—are important, human capital is the most important. Indeed, in a modern economy, human capital is by far the most important form of capital in creating wealth and growth.”⁶

There is a striking correlation between a country's level of human capital and its economic well-being. At the same time, there is a striking *lack* of correlation between natural resources and standard of living. Countries like Japan and Switzerland are among the richest in the world despite having relatively poor endowments of natural resources. Countries like Nigeria are just the opposite; enormous oil wealth has done relatively little for the nation's standard of living. In some cases, the mineral wealth of Africa has financed bloody civil wars that would have otherwise died out. In the Middle East, Saudi Arabia has most of the oil while Israel, with no natural resources to speak of, has a higher per capita income.

High levels of human capital create a virtuous cycle; well-educated parents invest heavily in the human capital of their children. Low levels of human capital have just the opposite effect. Disadvantaged parents beget disadvantaged children, as any public school teacher will tell you. Mr. Becker points out, “Even small differences among children in the preparation provided by their families are frequently multiplied over time into large differences when they are teenagers. This is why the labor market cannot do much for school dropouts who can hardly read and never developed good work habits, and why it is so difficult to devise policies to help these groups.”⁷