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The Big Earners and the Big Losers

To put the question in the bluntest possible way, let's say that machine intelligence helps us make a lot more things more cheaply, as indeed it is doing. Where will most of the benefits go? In accord with economic reasoning, they will go to that which is scarce. In today's global economy here is what is scarce:

1. Quality land and natural resources
2. Intellectual property, or good ideas about what should be produced
3. Quality labor with unique skills

Here is what is not scarce these days:

1. Unskilled labor, as more countries join the global economy
2. Money in the bank or held in government securities, which you can think of as simple capital, not attached

to any special ownership rights (we know there is a lot of it because it has been earning zero or negative real rates of return)

We see high returns to resource owners, such as the new-resource millionaires and billionaires of Brazil, Russia, Canada, and Australia, and similarly huge revenues for intellectual property giants such as Apple and other innovators in that sector. The current array of scarce and plentiful resources now means high wages or capital gains to talented and inventive workers, and pretty low returns on ordinary labor and ordinary savings. Don't forget this larger picture, but in this book I'll be focusing on the labor market side of the equation and what that will mean in our lifetimes.

It was true in the great Industrial Revolution of the nineteenth century and it is true now: Machines do not put us all out of work, as eventually machines create new jobs just as they destroy old ones. It is also true that the new machines of our age will give rise to new and different workplaces and create a new set of winners and losers.

General Philip M. Breedlove, US Air Force vice chief of staff, works with military drones. He recently remarked, "Our number one manning problem in the air force is manning our unmanned platforms." This includes workers to fix and maintain the drones and analysts to sort through the subsequent video and surveillance feeds.

According to the air force, keeping an unmanned Predator drone in the air for twenty-four hours requires about 168 workers laboring in the background. A larger drone, such as the Global Hawk surveillance drone, needs about 300 people working in the background to make the mission feasible. To compare, the

operation of an F-16 fighter aircraft requires fewer than 100 people for a single mission.

As intelligent-analysis machines become more powerful and more commonplace, the most obvious and direct beneficiaries will be the humans who are adept at working with computers and with related devices for communications and information processing. If a laborer can augment the value of a major tech improvement by even a small bit, she will likely earn well.

That means humans with strong math and analytic skills, humans who are comfortable working with computers because they understand their operation, and humans who intuitively grasp how computers can be used for marketing and for other non-techie tasks. It's not just about programming skills; it is also often about developing the hardware connected with software, understanding what kind of internet ads connect with their human viewers, or understanding what shape and color makes an iPhone attractive in a given market. Computer nerds will indeed do well, but not everyone will have to become a computer nerd.

This dynamic—higher earnings for those who "get" computers—affects many sectors beyond Silicon Valley. This isn't merely a story about science, technology, engineering, and math majors (STEM), because a lot of scientists aren't getting jobs today, especially if they don't do the "right" kind of science. Does anyone envy the job prospects of a typical newly minted astronomy PhD? On the other hand, Mark Zuckerberg of Facebook fame was a psychology major, and insights from psychology helped him make Facebook into a more appealing and alluring site. The ability to mix technical knowledge with solving real-world problems is the key, not sheer number-crunching or programming for its own sake. Number-crunching skills will be turned over to the machines sooner or later.

Marketing

Despite all the talk about STEM fields, I see *marketing* as the seminal sector for our future economy.

A salesperson can use knowledge of computers or engineering to sell a complex technical product to a technically sophisticated user, and in fact such knowledge might these days be required to sell effectively. That's based in some STEM skills, but it's also marketing. The entertainment sector is about marketing, especially as the internet makes the array of available cultural products ever more crowded. It might appear that a masseuse is not much affected by computers, at least provided you are skeptical about these robots that now offer massages. Nonetheless, masseuses increasingly market themselves on Google and the internet. These masseuses fit the basic model that favors people who can blend computer expertise with an understanding of how to communicate with other people. Again, it is about blending the cognitive strengths of humans and computers.

We can expect a lot of job growth in personal services, even if those jobs do not rely very directly on computing power. The more that the high earners pull in, the more people will compete to serve them, sometimes for high wages and sometimes for low wages. This will mean maids, chauffeurs, and gardeners for the high earners, but a lot of the service jobs won't fall under the service category as traditionally construed. They can be thought of as "creating the customer experience." Have you ever walked into a restaurant and been greeted by a friendly hostess, and noticed she was very attractive? Have you ever had an assistant bring you coffee before a meeting, touching you on the shoulder before leaving the

cup? Have you gone to negotiate a major business deal and been greeted by a mass of smiles and offers of future friendship and collaboration? All of those people are working to make you feel better. They are working at marketing.

It sounds a little silly, but making high earners feel better in just about every part of their lives will be a major source of job growth in the future. At some point it is hard to sell more physical stuff to high earners, yet there is usually just a bit more room to make them feel better. Better about the world. Better about themselves. Better about what they have achieved.

The growing importance of marketing integrates two seemingly unrelated features of the modern world: income inequality and increasing pressures on our attention. The more that earnings rise at the upper end of the distribution, the more competition there will be for the attention of the high earners and thus the greater the importance of marketing.

If you imagine two wealthy billionaire peers sitting down for lunch, their demands for the attention of the other tend to be roughly equal. After all, each always has a billion dollars (or more) to spend and they don't need to court each other for favors so much. There is a (rough) parity of attention offered and received. Of course, some billionaires are more important than others, or one billionaire may court another for the purpose of becoming a megabillionaire, but let's set that aside.

Compare it to one of those same billionaires riding in a limousine, with open windows, through the streets of Calcutta. A lot of beggars will be competing for the attention of that billionaire, and yet probably the billionaire won't much need the attention of the beggars. The billionaire may feel overwhelmed by all of these demands, and yet each of these beggars will be trying to find some

way to break through and capture but a moment of the billionaire's attention.

This in short is what the contemporary world is like, except the billionaire is the broader class of high earners and the beggars are wealthier than in India. Instead of begging, there is a large class of people trying to command our attention using modern technologies such as email, spam, AI-targeted advertisements, coupons, Groupons, direct mail, advertising supplements in your credit card bill, and flashing ads on the internet, among hundreds of other techniques. All will appeal to our vanity and promise us a splendid customer experience of some kind or another.

For the high earners, life will feel better than ever before, but at the same time life will feel more harried and more overloaded with information than ever before. These phenomena are in fact two sides of the same coin, and this tends to get overlooked. After all, when income and wealth disparities are pronounced, everyone who isn't at the very top will be scrambling for the attention of those who are.

This is not to say what is being marketed to the highest earners is worthless or necessarily corrupt. The 19 percent below the 1 percent at the top do not depend for their wages or earnings purely on getting or giving the right kind of attention. But getting attention will continue to be a critical function in the new world of work and is likely to require ever-greater effort and sophistication.

There are other essential roles to be played, of course. For the top 1 percent of earners in America, a lot of the big gains come in the zip codes of New York City, the Upper West Side zip code of 10023 being number one. The Upper East Side does well, as does Scarsdale (a suburb of New York), Cupertino, and Potomac and Bethesda near Washington, D.C. This reflects how many of the very highest

earners come from internet companies and finance, with some government and law thrown into the mix. There has been Steve Jobs, Mark Zuckerberg, and Bill Gates, but finance is a common source of riches within the very highest tier of earners. To give one extreme but illuminating example, in 2007 the top twenty-five hedge fund earners pulled in more income than all the CEOs of the S&P 500 put together. The modern financial sector has computers, computerized trading, arbitrage, super-rapid communications, and computerized risk assessment at its core.

But don't just focus on those computers; it's also about management. The CEOs and higher-level managers are paid handsomely to assemble and direct the individuals who work every day with mechanized intelligent analysis. If you have an unusual ability to spot, recruit, and direct those who work well with computers, even if you don't work well with computers yourself, the contemporary world will make you rich. If we look at the increase in the share of income going to the top tenth of a percent from 1979 to 2005, executives, managers, supervisors, and financial professionals captured 70 percent of those gains.

Another development is this: The better the world is at measuring value, the more demanding a lot of career paths will become. That is why I say "Welcome to the hyper-meritocracy" with a touch of irony. Firms and employers and monitors will be able to measure economic value with a sometimes oppressive precision.

The coming world of hyper-meritocracy I'm sketching is not necessarily a good and just way for an economy to run. It will be more productive, and it is true that economic productivity is correlated with many good or apparently good qualities, including higher earnings, better health (usually), and greater financial responsibility toward one's family. But are productive people always

happier? Always more creative and reflective? Do they always bring more joy to others? Must we all try to be highly productive, no matter how ill-fitting the suit may be? I am not trying to settle these debates at any kind of moral level, but rather to ask how very productive people will fare in the job market as we move forward. We'll be reading of some particular good or bad results for the productive and the less productive, but let's investigate where those results are coming from before we get emotionally involved in an overall moral judgment.

Note that much the same could be said regarding my numerous references to the words *smart* and *intelligent* and *conscientious* and *talented*. Sure, these are good qualities overall, but we don't always need to prize them above all other human qualities. How we value them does have a moral implication, but such moral judgments can be left to each and every one of us to make.

In any case, the slacker twenty-two-year-old with a BA in English, even from a good school, no longer has such a clear path to an upper-middle-class lifestyle. At the same time, Facebook, Google, and Zynga are now so desperate for talent that they will buy out other companies, not for their products, but rather to keep their employees. It's easier and cheaper to buy the companies than to try to replicate their recruiting or lure away their best employees. Often the purchased product lines are abandoned. A recent report laid out how these acquisitions work: " 'Engineers are worth half a million to one million,' said Vaughan Smith, Facebook's VP of corporate development, who has helped negotiate many of the 20 or so talent acquisitions made by Facebook in the last four years." The technology blogs call this being "acqhired," and this practice is being ramped up in what is otherwise a slow job market. It's not slow for those who work with the intelligent machines.

Below the mega-achievers and the billionaires, job growth for ordinary workers is consistent with this story of a bifurcated job market. Measured in the fall of 2011, over the span of a year jobs went up in electronic shopping establishments (up 11 percent), up in the category of "internet publishing, broadcasting, and web search portal" (up 20 percent), and up in "computer systems design, programming, and related," (up 5 percent). Professions that depend on STEM are the second-fastest-growing group in the United States, another example of the strong demand for technical skills.

Management

Whether you work for Google or for McDonald's, many ordinary wage earners are already asking why managers deserve so much more money than those lower down on the ladder. To better understand why the new world of work is turning out to be so good for qualified managers, let's consider this personal perspective.

As a professor, I am given a research assistant each year. Over the last twenty or so years, I have received some extraordinary assistance from some very good workers, students, and eventually, peers and coauthors.

About once a year I receive an offer, usually by email, from someone who wants to work as my research assistant for free. Typically the offer is accompanied by a resume, and for the most part these resumes appear quite good. The emails sound reasonable and friendly.

I turn such offers down. I don't think the applicants are lemons, but still I find that one research assistant is for me the right number, at least if I have a good one, as is usually the case. Even when it

comes to the assistant whom I have the time to manage, I am most of all concerned about having a conscientious person at my disposal.

The work with an RA is basically a team relationship, and the core problem is that I don't have the time to build another team, even if it doesn't cost me any money upfront. I don't have the time to work with and manage another person. To put this point in a broader business context, until another good manager is hired, there is no point in employing another assistant. It's the manager who is the scarce input, and that is one way to think about why managerial salaries have been going up so much. Managers play a role of growing importance in coordinating complex, large-scale production processes.

The intelligent-machine revolution is making the modern workplace more team-oriented. Machines, computers, and the internet allow us to string together large teams of cooperating labor, sometimes from around the world. When Apple produces an iPad, it strings together a network of producers in what is a virtually miraculous pattern of economic cooperation, ranging from designers in Cupertino, California, to Toshiba hard drives (a Japanese company, producing in the Philippines and China) to computer chips from Taiwan, to final assembly in China and marketing and retail expertise from around the United States.

The teamwork required to divide up a larger project into pieces requiring different skills in order to produce a better result has been a critical part of successful economies since Plato and Xenophon started talking about it thousands of years ago. But things have changed a little. Adam Smith wrote in 1776 that "division of labor is limited by the extent of the market" and since that time the market has gotten a whole lot bigger. The division of labor has expanded

accordingly, so skills get more and more finely focused and tuned—and that means the screwups of a single person can damage a very large and very valuable production chain. To hire a risky and iffy worker, without a competent overseer, simply isn't worth it, no matter how low the wage. And so a lot of workers have a hard time being picked up and integrated into productive teams.

It is precisely that process that managers are paid to make work more efficiently. It is a process that is continuing its long, long trend toward increasing importance. And, finally, it is why managers are being paid more.

Workers

Many of our service sectors, a lot of our precision manufacturing, our healthcare and education sectors, government bureaucratic employment, and our creative industries—to name but a few examples—rely less and less on the brute force of additional human labor. Even the military is more about manipulating advanced technology than just aiming a gun and shooting it, or stabbing with a bayonet. One bad soldier or engineer can ruin the efforts of many others, or if someone programs the drone wrong, all sorts of problems can arise. When it comes to these complex tasks, people have to know what they are doing, they have to want to learn, and they have to want to cooperate with their fellow workers. That means a growing role for workplace morale and consistency of execution.

Team production makes the quality of "conscientiousness" a more important quality in laborers. Managers need workers who are reliable. If you have a team of five, one unreliable worker is wrecking

the work of four others. If you have a team of twenty-five, one unreliable worker can negate the work efforts of twenty-four others. Managers will stay away from possibly destructive labor and they will put a lot of care into building and maintaining their teams.

It's not just that the bad workers are lazy or maybe destructive. It's that low quality workers spread bad morale to many others in the building. It's the troublemakers in a workplace who usually end up getting everyone else at one another's throats. Contemporary employers really do want to get these people out of the company altogether, or performing distant, solo jobs, such as driving a truck from one warehouse to another, rather than standing around the watercooler.

The growing value of conscientiousness in the workplace helps women do better than men at work and in colleges and universities. At my daughter's recent college graduation ceremony the awards for the top achievers in all of the school's programs and departments went almost entirely to women, including awards in science and mathematics.

It is well known from personality psychology, and confirmed by experience, that women are on average more conscientious than men. They are more likely to follow instructions and orders with exactness and without resentment. That means better jobs and higher wages for a lot of women in this new world of work, without a comparable upgrade for a lot of the men. There is plenty of evidence that women are less interested in direct workplace competition and more likely to work well in teams and more likely to seek work in teams. You can think of men as the "higher variance" performers at work. That means some men are more likely to be the very highest earners and also to exhibit extreme dedication to the task, perhaps to the point of being monomaniacal. At the very top

there will be a disproportionate share of men as CEOs, top chefs, and also chess players, among many other avocations. Other men, in greater numbers, will be more irresponsible, more likely to show up drunk, more likely to end up in prison, and more likely to become irreparably unemployable.

When the order and coherence and reliability of the supply chain are especially important factors, whom are you going to choose for those middling-level jobs? We already see that young men are the group hit hardest by the recession, in terms of their labor market opportunities. For instance, the unemployment rate for males aged 20–24 has averaged 14.16 percent for 2012.

Here is another, more general way to think about the shifting gender balance of power in education and parts of the workplace. The wealthier we become, the greater a cushion we have against total failure, starvation, and other completely unacceptable outcomes. In such a world, both women and men will indulge some propensities that otherwise might be stifled or kept under wraps or that would not have been affordable fifty or one hundred years ago. For some men, these propensities are quite destructive and this turns them into labor market failures.

Conscientiousness is especially valuable in two other important parts of the labor market: health care and personal services. Most healthcare workers are not doctors, and many of them are not geniuses. Nonetheless, you want to make sure these workers wash their hands when necessary, write down the correct information on the patient's chart, and measure the lab quantities correctly. Again, that's conscientiousness, and due to population aging, the number of healthcare jobs will continue to grow. It is no accident that female workers are especially well represented in these fields, as they are in education.

As workers are displaced by smart machines in manufacturing and other areas, more individuals will be employed as personal trainers, valets, private tutors, drivers, babysitters, interior designers, carpenters, and other forms of direct personal services. These are all areas where a patron—often a family or individual—expects a commission or request to be followed. "Pick up my kid from school." "Fix the electrical wiring." "Show up for my lesson at six o'clock." Most of these jobs require some applied skills but not monomaniacal commitment at the highest levels of world-class achievement. The premium is on conscientiousness, namely whether the worker can follow some straightforward requests with extreme reliability and basic competence. If you are looking to hire a concierge butler, the person really does have to be trustworthy.

If you're a young male hothead who just can't follow orders, and you have your own ideas about how everything should be done, you're probably going to have an ever-tougher time in the labor markets of the future. There won't be much room for a "rebel without a cause" or, for that matter, a rebel *with* a cause. It's not surprising that teen employment has been falling since the 1990s, well before the recent recession.

Let's draw up a simple list of some important characteristics in technologically advanced modern workplaces:

1. Exactness of execution becomes more important relative to an accumulated mass of brute force.
2. Consistent coordination over time is a significant advantage.
3. Morale is extremely important to motivate production and cooperation.

Recent research bears out these principles. Economists Timothy F. Bresnahan, Erik Brynjolfsson, and Lorin M. Hitt performed an extensive poll of managers, combined with follow-up interviews. They found that in the opinions of managers, computer use increases the need for skilled workers, computers tend to increase workers' autonomy, and computers increase the need and ability for management to monitor their workers. All of those features will feed into the need for workers who are smarter, better trained, and more conscientious.

The days of a lone worker in the field pushing a hoe are over, at least as a way to feed families. Think of the public works projects of the 1930s, such as paving a road. A healthy worker always can add some brute force to the endeavor, for instance by carrying bricks from one place to another on the construction site. The workers don't have to be brilliant—they require only a minimum of training—and while conscientiousness plays a role, the monitoring and enforcement problems are relatively straightforward, as the workers either carry the bricks or they do not.

To continue the contrast between two ways of organizing the world of work, I find it useful to go back in time to an era when income inequality was high and many individuals did not have adequate training for higher-wage jobs. From such a setting, I am struck by a passage by Henry Mayhew, who wrote about London labor markets in the mid-nineteenth century:

> Among the wares sold by the boys and girls of the streets are:—money-bags, lucifer-match-boxes, leather straps, belts, firewood . . . fly-papers, a variety of fruits, especially nuts, oranges, and apples; onions, radishes,

water-cresses, cut flowers and lavender (mostly sold by girls), sweet-brier, India rubber, garters, and other little articles of the same material, including elastic rings to encircle rolls of paper-music, toys of the smaller kinds, cakes, steel pens, and penholders with glass handles, exhibition-medals and cards, gelatine cards, glass and other cheap seals, brass watch-guards, chains, and rings; small tin-ware, nutmeg-graters, and other articles of a similar description, such as are easily portable; iron skewers, fuzees [matches], shirt-buttons, boot and stay-laces, pins (and more rarely needles), cotton bobbins, Christmasing (holly and other evergreens at Christmas-tide), May-flowers, coat-studs, toy-pottery, blackberries, groundsel, and chickweed, and clothes'-pegs.

Grabbing the attention of customers right there on the grubby street was critical to this life. Marketing was primitive at best. And it is striking how little overhead most of these jobs had. No benefits. No rent. Not much advertising, at least not beyond standing on the corner and screaming out the name of the product. No human resources department and no real risk of lawsuits. There was nothing romantic about these bleak and poorly paid jobs, but they are an interesting contrast to the way employment works today.

For a suitable contrast, consider the office suite at Google. The workers receive health insurance, extensive training, a lot of time and attention, and an attractively decorated office, including a dedicated play space with fun toys. The food in the cafeteria is excellent and includes Indian curries, finely spiced, and tasty vegan and vegetarian choices. These jobs have overhead.

Not just anyone can show up and grab a desk, because the

company cares very much about who is part of the team. To work at Google you have to go through a tough interview process. Here are three interview questions—typical of the rigor—that have been asked of prospective Google employees:

"How many times a day does a clock's hands overlap?"

"You need to figure out the highest floor of a one-hundred-story building an egg can be dropped from without breaking. The question is how many drops you need to make. You are allowed to break two eggs in the process."

"The probability of a car passing a certain intersection in a twenty-minute window is 0.9. What is the probability of a car passing the intersection in a five-minute window?"

Easy enough? There's a whole book titled *Are You Smart Enough to Work at Google?* by William Poundstone. A few minutes reading it will make the answer clear to most readers, even if the word *smart* is not exactly the right word (Picasso was a genius but I doubt he could have landed a job at Google's Mountain View headquarters).

It's a far cry from the London city streets, where any kid could show up and sell gelatin cards, taking his chances with market demand.

Might a boss wish to mix the two modes of employment? Google could keep its current full-timers at their desks and play stations, and rope off a part of the building where just about anyone could come in and try to sell something. You would find venture entrepreneurs peddling their new ideas to Google staff and immigrants selling lunch tacos. Imagine a floor of the building devoted to such a commercial free-for-all.

Google doesn't mix modes of employment this way because it

wishes to control what goes on under the Google aegis. Mixing modes would involve a lot of distractions, it would blur what Google is all about, it would require enforcement measures to keep the traditional Google-linked parts of the building orderly, and sooner or later it would bring a lot of lawsuits.

At a lot of growing firms, the capital surrounding a worker is going up. Benefits cost more, the firm cares more about its morale and workplace environment, the firm cares more about its overall reputation (workers represent a firm to the broader outside world), and the firm faces a higher risk of lawsuits. Workers are more capable of doing damage to a firm than in times past, so companies are often getting choosier whom they hire. It is easier to destroy than create, and the more valuable and the more precision-based that firms become, the more they will worry about destruction of value coming from workers.

Any time there is a discussion of management strategies, you probably will hear a lot of words like *teamwork, morale*, and *integrity*. That's all well and fine, but what if we substitute *exclusion* for all those nice warm phrases? They would be the same management strategies merely explained from a different point of view, namely of those who are kept away. There is no high morale without exclusion, no integrity without exclusion, and no corporate culture without exclusion. If the management styles at today's quality companies seem so nice, so friendly, and sometimes so downright heartwarming, it is possible only because those cultures are so very picky, snobbish, and elitist at the same time. There is no open door.

Basically what's happening is that a lot of jobs are becoming more like Google—you have to meet a certain grade or you are out—and there is another lower tier of jobs becoming just a bit more like Mayhew's 1850 London streets, albeit at higher

wage levels. Structural unemployment is the bumpiness that we experience when some individuals have to move from one mode of work to the other, because not everyone is suited to work at Google.

You might think it's only Google and a few elite firms moving in this direction—meet a certain grade or you are out—but the practice is spreading to many corners of the job market. For instance, it's now common that a fire chief has to have a master's degree. That may sound silly and perhaps you think a master's degree has not very much to do with putting out fires. Still, often it is desired that a firefighter be trained in emergency medical services, antiterrorism practices, and fire science (for instance, putting out industrial fires), and there is a demand for firemen who, as they move into leadership roles, can do public speaking, interact with the community, and write grant proposals. A master's degree is no guarantee of skill in these areas, but suddenly the new requirements don't sound so crazy anymore.

In fact, there is a whole host of jobs that now very often require college degrees, although of course not usually a master's. These jobs include dental lab technicians, chemical equipment operators, medical equipment preparers, and buyers and purchasing agents, among others.

We have been seeing what is called "labor market polarization," a concept that is most closely identified with MIT labor economist David Autor. Labor market polarization means that workers are, to an increasing degree, falling into two camps. They either do very well in labor markets or they don't do well at all. It's hardly the case that America has lost its middle class as of 2013, and I would urge you to stay away from some exaggerated accounts of the middle class having been "decimated," but looking toward the future

the trend is clear: The middle of the distribution is thinning out and this process appears to have a long ways to run. And to be blunt—while I know I can't prove this—I wonder how much of the middle class consists of people in government or protected service-sector jobs who don't actually produce nearly as much as their pay.

Of the jobs lost during the recession, about 60 percent of them were in what are called "mid-wage" occupations. What about the jobs added since the end of the recession? Seventy-three percent of them have been in lower-wage occupations, defined as $13.52 an hour or less. This general trend, namely more rapid growth in low-paying jobs, can be seen in the numbers from 1999 to 2007, so we can't blame it on the financial crisis or the particular problems of today.

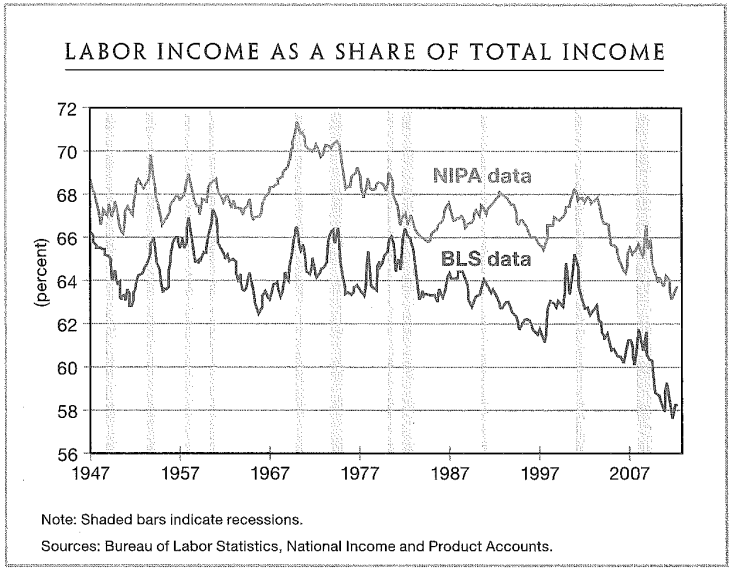
Even since the recession ended, we see wages for the typical worker continue to decline. From June 2009 (the official end of the recession) to June 2011, inflation-adjusted median household income fell 6.7 percent, more rapidly than it fell during the recession itself (3.2 percent). Median income in 2011 was more than 8 percent lower than in 2007 and indeed median household income peaked in 1999. There's room to dispute how exact these numbers are, but they do show longer-term structural forces at work. A lot of jobs aren't worth as much as before, and they are not being replaced by a comparable number of high-earning slots.

It's pretty common to see new jobs at companies such as General Electric or Caterpillar, and the new jobs cover pretty much the same tasks as the old jobs. Yet the new workers are earning ten or fifteen dollars less an hour, and the companies are putting up with the morale problems involved with having two different tiers of workers.

The numbers also show that earnings from labor are a falling share of total output. In 1990, 63 percent of American national

income took the form of payments for labor, but by the middle of 2011 it had fallen to 58 percent. Most developed countries—including Germany, France, and Japan—have seen similar trends. These trends start about 1980, but note also that the income share *for skilled sectors* has been on the rise, going up by about five percentage points in countries where English is the dominant language.

Here is what the trend for the United States looks like:



If there is one picture that sums up the dilemma of our contemporary economy, it is that one.

Of course, there is a lot going on within the category of labor earnings. The longer-term trend is fewer jobs in middle-skill, white-collar clerical, administrative, and sales occupations. Demand is rising for

low-pay, low-skill jobs, *and* it is rising for high-pay, high-skill jobs, including tech and managerial jobs, but pay is not rising for the jobs in between.

This is not just a story about America, as broadly similar patterns are occurring in the major industrialized nations of Europe. In sixteen major European nations, from 1993 to 2006, middle-wage occupations declined as a share of employment. In thirteen of those sixteen countries, high-wage occupations increased as a share of employment. In all sixteen countries, low-wage occupations rose as a share of employment, relative to middle-wage occupations. There are more really good jobs but more really bad jobs involving exhausting low-wage work too—the kind that might even shorten your life.

The pattern for the really good jobs and the higher earnings is pronounced. If we look at the last ten years and divide the population up by education, there is only one group that has come out ahead with higher wages: individuals with advanced postgraduate degrees. If you had a PhD, on average your earnings went up a little over 5 percent, and if you had an MD, JD, or MBA, average earnings went up a little less than 5 percent. Even for holders of master's degrees, earnings were down an average of about 7 percent. Average earnings were down about 8 percent for individuals with a bachelor's and down 10 percent for individuals with some amount of college but no four-year degree.

It's clear: The world is demanding more in the way of credentials, more in the way of ability, and it is passing along most of the higher rewards to a relatively small cognitive elite. After all, the first two categories of earnings winners—namely those with advanced degrees—account for only about 3 percent of the US population.

Careers

So a smart young person gets a good education and is deciding what to do with it. Why are so many of these people going into finance, law, and consulting?

There is a common impression—by no means illusory—that smart young people from top schools can walk into high-paying jobs in these areas with relative ease, even if they don't have much or indeed any real-world experience. They start at salaries above the US median household income, and very quickly many of them are earning above six figures. In finance they may be paid bonuses of millions within years, at least if they come along during the right years. Beneath all the chatter is a sense that these salaries are possibly unmerited or unjust, because, to repeat an expression I used to hear from my father (he was a businessman of the old school): "I wouldn't trust him in charge of a candy store." If you took a few of these same young workers out of the consulting firm and put them on a factory floor, they probably would be lost. They do seem to be an impractical bunch.

There are some particular reasons why employment opportunities are growing in finance, law, and consulting. Today, laws are more numerous and more complicated than in my father's day, and that increases the demand for lawyers, at least at the top end of the market. A global economy means longer supply chains, and consultants can help businesses track and evaluate those complex operations. Finance is growing in part because the promise of bailouts encourages banks to become larger and also take on more risk. But

I wish to put those (valid) points aside and focus on some more general reasons why smart but underspecialized young people are finding so many good opportunities in these sectors.

As a general rule, the age structure of achievement is being ratcheted upward due to specialization and the growth of knowledge. Mathematicians used to prove theorems at age twenty, but now it happens at age thirty because there is so much more to learn along the way. If you are a talented twenty-two-year-old, just out of Harvard, you probably cannot walk into a furniture factory and quickly design a better machine. Young people *have* made fundamental contributions in some of the internet and social networking sectors, precisely because of the immaturity of those sectors. Mark Zuckerberg needed a good grasp of Myspace, but he didn't have to master decades of previous efforts on online social networks. He was close to starting from scratch. In those cases, young people tend to dominate the sector, but of course that won't cover the furniture factory.

Now take a typical young person, not furniture-machine savvy but just out of Harvard with, say, a degree in economics. She and her parents expect her to earn a high income—now—and to affiliate with other smart, highly educated people, maybe even to marry one of them someday. It won't suffice to move to Dayton and spend four years studying how coffee tables are built.

These freshly minted students will seek out jobs that reward a high "g factor," or high general intelligence. That means finance, law, and consulting. The students are productive fairly quickly, they make good contacts with other smart people, and they can demonstrate that they are smart, for future employment prospects. Working to exercise and demonstrate their general intelligence is in fact the main thing they are good for, and moving beyond this can take quite a few years.

Consider consulting. Take a smart but inexperienced and

underspecialized twenty-two-year-old and ask, "Can you draw up an effective PowerPoint for me?" or "Can you research this new accounting practice or new congressional law?" or even "What is wrong with this business plan?" You might get some pretty good answers. And so there is a demand, from the side of the company, to hire that general intelligence. In due time, the hired smart young people may become leaders or partners in the firm, and along the way they will acquire experience in applying their general intellectual abilities to concrete business problems.

We tend to glamorize these well-paying jobs. If we can set aside the glamour and perhaps our envy, we might notice that our society does not know what else to do with these people, who are otherwise not always very productive.

Fortunately (for them), they really are needed. The more the rest of the world specializes in production, the more that general intelligence can produce some value. Forget about a detailed knowledge of the factory floor, the specialists in Dayton are missing out on the big picture. Try some simple questions and admonitions: "Hey you, think about what you are doing! Are you sure? How about *this*? Are you *sure* that's the best way to treat your workers?" "Do you really understand what is going on in global markets? Come take a look at my PowerPoint."

It often sounds like meaningless or bogus clichés to outsiders, but very often the people in the field do not get it or do not think very conceptually about their own operations. It's not in their training, and in the meantime they have become hyperspecialized in some very particular daily routines, such as mastering how a factory for producing furniture should be run. Every now and then these questions, rooted in general intelligence, pay off and generate a high expected return. The ever so popular management books,

which can seem so banal to outside observers, are also attempting to supply critical outside general intelligence. It's a hard set of conceptual skills to communicate and then turn into practice, and thus the demand for consultants—including young consultants—won't be disappearing anytime soon. The flow of business and management books will probably never end.

Labor markets are tough, and not always fair, but intelligence will be rewarded for a long time to come. So will the right skills in STEM fields, finance, management, and marketing, all of which meld together the strengths of diverse intelligences, whether those intelligences are human or not.

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