



April 2, 2004

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The Future of Jobs: New Ones Arise, Wage Gap Widens

**Outsourcing, Technology Cut
Need for Rote Workers;
Brainpower Is in Demand**

Hot Area: Massage Therapy

By **DAVID WESSEL**
Staff Reporter of THE WALL STREET JOURNAL
April 2, 2004; Page A1

(See Corrections & Amplifications item below⁰.)

Much of the American anxiety about outsourcing to India and China can be boiled down to this simple question: Will there be good jobs left for our kids?

It's easy to see why there is so much concern. Tens of millions of increasingly skilled Chinese and Indian workers are joining the global economy at a moment when technology can dispatch white-collar work overseas almost instantly -- from call centers to sophisticated design projects, the very jobs that discouraged U.S. factory workers hoped their children would get.

PREDICTIONS VS. REALITY

See [which occupations⁰](#) are expected to lose the most jobs between 1988 and 2000.

WHEN U.S. JOBS GO ABROAD



¹ Amid a "jobless recovery" and presidential-year politics, outsourcing is drawing strong reactions. Check out our [overview²](#) and [online roundtable³](#) for perspectives, and see [complete coverage⁴](#).

decade ahead are likely to demand the more complex skill of recognizing patterns or require human contact.

The good news: The U.S. almost certainly isn't going to run out of jobs, even though history shows that it's impossible to predict what new jobs will replace those that are destroyed. The bad news: Outsourcing overseas and technology could widen the gap between the wages of well-paying brainpower jobs and poorly paid hands-on jobs.

Jobs that can be reduced to a series of rules are likely to go -- either to workers abroad or to computers. The jobs that stay in the U.S. or that are newly created in the

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The 25%-plus unemployment rates of the Great Depression are extremely unlikely to return as long as the U.S. has a capable Federal Reserve that can move interest rates, a president and Congress that will cut taxes and increase spending when the economy slides and a widely used currency that falls when necessary to make exports more attractive. After all, the "jobless recovery" of the early 1990s was followed by a stretch of the lowest unemployment in a generation.

Each generation considers its own time to be unique. Today's popular demon is foreign competition. Forty years ago, it was automation. In March 1964, three dozen liberal luminaries wrote Lyndon Johnson that "the combination of the computer and the automated self-regulating machine" was creating "almost unlimited productivity capacity which requires progressively less human labor." Without massive government spending, they warned, the U.S. would suffer mass joblessness and poverty.

Since then, the U.S. economy has added 72 million jobs, an increase of 125%. Compared to a counterpart of the same age and schooling, the typical full-time male worker's wages have risen by 18% after adjusting for inflation; for women, wages are up 37%. Today's unemployment rate is almost exactly where it was in 1964. Computers in the factory and in the office have replaced humans. But jobs lost were replaced by jobs unimagined in 1964.

Bound to Disappear

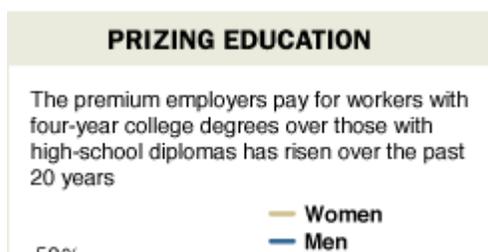
More jobs are bound to disappear. "If you can describe a job precisely, or write rules for doing it, it's unlikely to survive. Either we'll program a computer to do it, or we'll teach a foreigner to do it," says Frank Levy, a Massachusetts Institute of Technology economist. If a worker can respond to a baffled U.S. computer user by reading a script from a computer screen, that job will go to India. If voice-recognition software can field a magazine-subscription request, that job will go to a computer.

"Outsourcing accelerates what technology was already doing," Mr. Levy adds. "Take call centers. Eight, 10 years down the line, we could do a lot more with voice-recognition software. But with outsourcing you can do away with those jobs now."

New jobs surely will emerge to replace those lost. That's happened with every past breakthrough in technology and trade. "In 1940," observes chief White House economist Greg Mankiw, "no one could have predicted that some grandchildren of farmers would become Web-site designers and CAT-scan operators. But they did, and at much higher wages and incomes."

This time, two different kinds of jobs are likely to flourish amid outsourcing and computerization.

One sort requires physical contact -- nursing-home aides, janitors, gardeners, dentists. Foreign-born workers may do them, but they'll have to move to the U.S. A 2000 survey found that the average starting salary of graduates of community-college dental-hygiene programs was \$41,900.



A hot program at many community colleges these days is massage therapy. Springfield Technical Community College in western Massachusetts gets nearly 50 applications each year for the 20 slots in its six-year-old program, nearly all of them from women. Graduates earn an associate's degree and haven't had any trouble finding

work, says Bernadette Della Bitta Nicholson, who runs the program. About a third go to work for local spas, which give therapists half of the \$80-an-hour charge for a massage. Another third find work at local health-care facilities and the remainder go into business for themselves.

The other sort of jobs destined to remain here are high-end jobs. Some require exchanging information in ways that e-mail and teleconferencing don't handle well. Think about teaching first grade or selling a mansion to a multimillionaire or conceiving new forms of software. Others demand such intimate knowledge of the U.S. that it's hard to see foreigners doing them from afar. Think about marketing to American teenagers or lobbying Congress.

Precisely identifying jobs that will replace those now disappearing is impossible. The Bureau of Labor Statistics, as good as anyone at this exercise, shows just how difficult it is.

In 1988, the agency predicted that the number of gas-station attendants would rise from 308,000 to 331,000 in 2000. When 2000 arrived, there were only 140,000. "Most gas stations are now self-service only," BLS economists Andrew Alpert and Jill Auyer explained in a candid retrospective the agency published. The BLS didn't see that coming.

In 1988, the BLS also projected travel agents would be among the 20 fastest-growing occupations, their ranks growing by 54% by 2000. Wrong again. The number of travel agents fell by 6.2%. Government prognosticators foresaw an increase in travel -- but not the explosion of online booking.

Of 20 occupations that the BLS predicted in 1988 would suffer the greatest losses between 1988 and 2000, half actually grew. The agency predicted that the number of assemblers in electrical and electronic factories would drop by 173,000, a 44% decrease. Twelve years later, there were 45,000 more, an 11% increase. Neither outsourcing nor robots made as much of a dent as the BLS expected.

In trying to discern persistent trends, Mr. Levy distinguishes between jobs that require workers to follow rules and those that require them to recognize patterns. The first -- whether in manufacturing or services -- are vulnerable to technology and outsourcing. The second are less vulnerable.

Consider income-tax preparation. "The tax system is based on rules ... built into software like TaxCut and Turbo Tax," Mr. Levy and Harvard economist Richard Murnane write in "The Division of Labor," a forthcoming book. "While the preparation of complex tax returns requires expert human judgment, many other tax returns do not. ... So it is not surprising that the preparation of routine income tax returns is beginning to move offshore." Ernst & Young LLC is sending some simple tax-return processing work to India, and a handful of U.S. companies have sprung up to help smaller accounting firms do the same.

In contrast, other jobs rely on the human ability to recognize patterns -- the truck driver turning left across traffic, for instance, or the seasoned physician diagnosing an unusual disease. The doctor may rely on X-rays read by a radiologist in India or blood tests processed automatically, but diagnosing disease remains a complex human endeavor. Such jobs are proving much harder to computerize than high-tech prophets anticipated. They also are much harder to supervise from afar and thus more resistant to outsourcing abroad.

Community colleges, publicly funded two-year colleges, excel at sniffing out jobs for which local employers are hiring -- and then training for them. "Some of this stuff isn't very scientific. It's just paying attention," says Andrew Scibelli, president of Springfield Technical Community College. "When my former wife was having our child 15 years ago and had an ultrasound, I was talking to the sonographer and asked where she got her training. 'I didn't. I'm an X-ray tech. The doctors and the folks who make the equipment showed me how to do this,' she said." Mr. Scibelli went back to his office and asked his staff to look into a training program, talked to local employers, got the OK of the state bureaucracy and started a program.

Today, the program, started in 1994, draws more than 100 applicants each semester but accepts only 10, most of whom take about three years to complete the prerequisites, the coursework required for certification and clinical rotations. Graduates start at between \$20 and \$28 an hour.

These days community colleges are baffled by conflicting forecasts about the job outlook. "There is an incredible angst about the jobless recovery and yet there's no change in the forecast that 10 years out there will be this incredible skills shortage," says Albert Lorenzo, president of Macomb Community College outside Detroit. "All of us are trying to reconcile this."

Wider Gap

One unpleasant possibility, acknowledged even by those firmly in the trade-is-good camp, is that jobs will proliferate at both ends of the barbell -- and fewer in the middle. The result would be an ever-wider gap between well-paying jobs and poorly paid jobs. That, too, has happened before, as recently as the 1980s when unionized skilled manufacturing jobs evaporated.

The overall pace of wage increases in the U.S. generally tracks growth in productivity, the amount of goods and services produced for each hour of work. But in any economy, wages for workers in high demand rise and wages for others lag or even fall.

For the past couple of decades, the forces of economic change have favored workers with education and skills. Though unemployment among college graduates has risen lately, the jobless rate among workers with a four-year college degree remains only 3%, well below 5.5% for high-school graduates and 8.5% for high-school dropouts.

Not every American worker whose job is now threatened is going to become a high-level software architect. What if there are only a handful of safe jobs like that left? Will everyone else's wages relentlessly fall until they meet those of Indians and Chinese in some new global equilibrium?

Beginning in the 1980s and extending into the 1990s, demand for educated workers grew far faster than the increased supply, pushing their wages far above those of lesser-skilled workers. Wages of men over age 25 with a four-year college degree are now typically 41% higher than wages of similar men with a high-school diploma, according to an analysis of government data by the Economic Policy Institute, a Washington think tank. Twenty-five years ago, the differential was just 21%. For women, the premium for a college diploma has grown to 46% from 25%

In the late 1990s boom, wages at the very top continued to climb faster than everyone else's. But wages at the bottom moved closer to the middle class, pushed up by an unemployment rate so low that "help wanted" became the universal slogan of American businesses and by increases in the minimum wage. When the economy deteriorated in 2000 and unemployment rose, wages at the bottom fell while wages at the very top kept climbing. The premium employers pay for a college

diploma remains high, though it hasn't grown lately.

Will technology, trade and outsourcing further widen the wage gap between the best- and worst-paid workers?

Right now, the economic winds seem to be blowing that way. "America's long-term problem isn't too few jobs," Robert Reich, the former Clinton administration labor secretary now at Brandeis University, wrote in a Wall Street Journal opinion article last December. "It's the widening income gap. The long-term solution is to spur upward mobility by getting more Americans a good education, including access to college. There will be plenty of good jobs to go around. But too few of our citizens are being prepared for them."

Without a major change in policy, such as an increase in the minimum wage or restraints on immigration, or a seismic shift in the economy, such as a surge in unions or limits on imports, the economic forces widening the gap between wages of winners and losers appear strong.

A lot depends on what happens to the latest victims of change, the white-collar analogs of the steelworkers, auto workers and other blue-collar workers pushed aside by trade and technology in the 1980s and 1990s. Some were forced to compete for poorly paid jobs with unskilled workers, including recent immigrants, pushing wages at the bottom down. Others, often with government aid, got skills needed to move up a notch.

"Rather than thinking of a career ladder," says Mr. Lorenzo, the Michigan community-college president, "we've started to refer to it as rock climbing. It's no longer a rung-by-rung clear linear progression." Some auto mechanics never mastered the repair of cars as manufacturers stuffed them with computer chips; others learned how to diagnose the computerized auto engine as well as the faulty fuel pump and prospered.

Today, the sophistication of computers and spread of overseas outsourcing threaten many of the jobs that replaced old factory jobs.

So there is another fork in the road. The low road takes these middle-skilled workers into competition for jobs washing, baby-sitting, serving and nursing the elite educated well-paid classes -- pushing down wages at the bottom. The high road takes them to jobs more skilled than those they lost, the jobs that Chinese and Indians may do someday, but not yet.

Those who bet on the high road inevitably call for better educating American workers so they have skills to stay one step ahead of jobs that computers and foreign workers do. It is clear that to be a successful middle-skilled worker in the U.S. takes increasingly more schooling.

But education is a slow escalator. Harvard University President Lawrence Summers calls it "the ultimate act of faith in the future."

"There are two kinds of lies that politicians tell about outsourcing," says Mr. Levy, the MIT economist. "One is that we can turn it all back. But even if you cut off all trade, technology can do the same things to workers. The other is that education is all that matters. That's true, of course, but only in the long run."

In the time spans over which economic progress is best measured -- in generations -- educating U.S. workers is the most appealing remedy for an economy that regularly pushes workers out of

jobs they were trained to do. Without better elementary and high schools, wider access to college and more training of mature workers, the gap between those with well-paying and poorly paid jobs is certain to grow.

Over the next five or 10 years, though, better high schools, more college-student aid and more pervasive workplace training don't seem sufficient to stop outsourcing, trade, improving technology and relentless cost-cutting from widening that gap.

Predictions vs. Reality

Occupations expected to lose the most jobs between 1988 and 2000, in thousands

	ESTIMATE	ACTUAL
Farmers	-266	-194
Farm workers	-153	-157
Electrical, electronic assemblers	-103	9
Garment-sewing-machine operators	-89	-324
Hand packers, packagers	-75	384
Precision assemblers, electrical and electronic equipt.	-71	35
Word processors, typists	-61	-503
Precision inspectors, testers, and graders	-42	18
Court reporters, medical transcriptionists, stenographers	-36	-55
Packaging- and filling-machine operators	-33	99
Machine feeders	-31	-35
Textile-machine operators	-30	-55

Source: Bureau of Labor Statistics

Corrections & Amplifications:

A forthcoming book by Frank Levy and Richard Murnane is titled "The New Division of Labor." The title was given incorrectly as "The Division of Labor" in this Page One article on the U.S. job market.

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