

Robots? Training? Factories Tackle the Productivity Puzzle

With unemployment low and wages creeping up, companies have an incentive to become more efficient — an exercise that tends to drive economic progress.

By Ben Casselman

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HICKSVILLE, Ohio — For Anthony Nighswander, rock-bottom unemployment is both a headache and an opportunity. For businesses and workers, it could be the key to reversing one of the country's most vexing economic problems: slow productivity growth.

Mr. Nighswander is president of APT Manufacturing Solutions, which builds and installs robotic equipment to help other manufacturers automate their assembly lines. Lately, business has been booming: With the unemployment rate now below 4 percent, he says he gets calls every day from companies looking for robots to help ease their labor crunch.

The problem is that Mr. Nighswander faces a hiring challenge in his own business, especially because, in this town of fewer than 4,000 people near the Indiana border, the pool of skilled workers is shallow. But rather than turn to robots himself, he has adopted a lower-tech solution: training. APT has begun offering apprenticeships, covering the cost of college for its workers, and three years ago it started teaching manufacturing skills to high school students.

“I never thought that I would be training high school students in our facilities,” Mr. Nighswander said. “What I knew was that I was in survival mode. I knew the orders for robots and for automation were coming in faster than I could get the jobs out.”



The pool of skilled workers is shallow in the area near the Ohio-Indiana border where APT Manufacturing Solutions is based. The company has responded in part by teaching manufacturing skills to high school students. Andrew Spear for The New York Times

That kind of urgency could prove to be a powerful economic force. The investments in training and automation by Mr. Nighswander and his customers should, over time, make their companies more productive. Multiplied across thousands of companies, those decisions could have benefits for companies and workers that endure even after today's hot economy inevitably cools.

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Productivity — how much value the economy generates in an average hour of work — gets less public attention than more intuitive economic concepts such as employment and wages, but it may be even more fundamental.

Rising productivity — whether through better technology, more educated workers or smarter business strategies — is why people's economic fortunes, on average, improve over time. When productivity growth is strong, companies can afford to pay workers more without eating into their own profit margins, letting a rising tide lift all boats.

Since the end of the Great Recession, however — and, to a lesser extent, even during the stronger economic times that preceded it — productivity growth has been confoundingly weak, forcing business owners and workers to compete over a relatively meager sliver of economic growth. There have been peaks and valleys, but not since the dot-com boom of the late 1990s and early 2000s has the American economy consistently delivered productivity growth above 2 percent a year.

Now some economists think a rebound could be on the way. For most of the recovery, wage growth has been anemic, suggesting companies faced relatively little pressure to invest in automation or to find other ways to squeeze more production out of workers. But as the labor market tightens, companies' incentives could be changing.

“You could meet demand for a while by hiring workers, but with the unemployment rate at 3.8 percent, eventually you're going to run out of easy-to-find workers,” said John G. Fernald, an economist at the Federal Reserve Bank of San Francisco and an expert on productivity. “Because workers have other opportunities, you end up having to pay them. And once you see wages going up, you say, ‘We have to become more productive to cover our costs.’”

That cycle could already be underway. Wage growth has crept up over the past two years. One measure preferred by many economists, the Employment Cost Index, posted its strongest year-over-year growth since the recession in the first three months of the year. And there are other indications that companies are struggling to find workers. Applications for disability insurance, for example, have begun to fall, a sign that companies may be more willing to look outside the standard labor pool to find employees. And while productivity has yet to rebound, corporate investment — historically a prelude to productivity growth — has been rising.

David Maletto, who runs a small packaging company in Eau Claire, Wis., said it had become increasingly difficult to find workers with the local unemployment rate below 3 percent. The company, which specializes in putting together variety packs of beers for Miller and other brewers, has had a particularly hard time holding on to unskilled laborers, who pack bottles into boxes and load them onto pallets. Turnover at those positions is constant, Mr. Maletto said, and the workers he finds to fill vacancies are often unreliable, showing up late, playing on their phones while on the clock or sometimes not showing up at all.

APT Manufacturing Solutions builds and installs robotic equipment to help companies automate assembly lines. Increasing productivity became urgent, its president said, when “orders for robots and for automation were coming in faster than I could get the jobs out.”

Andrew Spear for The New York Times

“We have customers continually coming to us and they’re needing packaging done, and we’ll have to say, ‘We can’t do that for you,’” Mr. Maletto said. “There were days when we might have to shut a line down.”

Mr. Maletto tried raising pay, first by 25 percent and then by an additional 20 percent. He now offers up to \$12 an hour for unskilled jobs and has tried offering signing bonuses. But workers can earn as much as \$5 an hour more elsewhere, a wage Mr. Maletto says he can’t afford, in part because multiyear contracts with some customers make it hard for him to raise prices.

So Mr. Maletto is turning to automation. Late last year, he installed a machine that loads filled boxes onto pallets; more sophisticated robots from APT, Mr. Nighswander’s firm, are set to arrive in August. Mr. Maletto took out a \$1 million loan to pay for the equipment, a big gamble for a family-owned company. But with the labor pool shrinking, he said he had little doubt it was the right decision.

“If we don’t get things automated and we don’t start moving things forward, we’re going to be the ones who get left behind,” Mr. Maletto said.

Decisions like Mr. Maletto’s aren’t the way economists have historically thought about productivity growth. In traditional economic models, productivity is determined by technological advances and business innovations that aren’t tied to the ebb and flow of recessions and recoveries. The economic boom of the 1920s, according to the standard narrative, was enabled in part by the spread of electric power. A similar pattern played out in the 1990s with the rise of personal computers. In both cases, technology paved the way for productivity, which in turn led to higher pay and faster growth.

But in recent years, some economists have begun to wonder if the conventional models might get the relationship backward. Perhaps periods of strong economic growth are what put pressure on companies to innovate, or at least to figure out how to use new technologies to make themselves more efficient. Maybe it isn’t a coincidence, in other words, that the last period of strong productivity growth also coincided with the last time the unemployment rate fell below 4 percent.

Gavin Wright, an economic historian at Stanford University who has studied the 1990s, argued that advances in information technology predated that productivity surge by a decade or more. What changed in the 1990s, he said, is that the labor market tightened.

“Right around the middle of that decade, you did start to get rising real wages for the first time in quite a long time,” Mr. Wright said. “Employers will be driven to, or be more likely to, think about ways to economize if the labor’s more expensive.”

An APT employee programming a robot. If companies respond to the tight labor market by taking steps to increase productivity, wages could rise without accelerating inflation. Andrew Spear for The New York Times

If Mr. Wright is correct, it could have significant implications for economic policy. If productivity growth is essentially fixed in the short term, as traditional models assume, then rising wages will most likely lead to faster inflation, as companies pass on higher costs to customers. That would most likely force the Federal Reserve to raise interest rates more aggressively to prevent the economy from overheating.

But if companies instead respond to the tight labor market by taking steps to increase productivity, then wages could rise without causing inflation. Under that approach, raising rates too quickly could be a costly mistake for the Fed, snuffing out the recovery before companies can make productivity-enhancing investments. That would be a particularly costly mistake because those investments carry long-term benefits — robots installed during a boom can keep running even when the economy slows.

“The cost of running policy too tight is not just what we don’t produce this year, it’s all the lost production and lost income for many years ahead,” said J. W. Mason, an economist for the Roosevelt Institute, a left-leaning think tank.

Not all economists are convinced that the tight labor market will lead to a productivity surge. Mr. Fernald, the San Francisco Fed economist, said that the low unemployment rate should stimulate investment, but that a more meaningful acceleration in productivity growth would require innovation. Jerome H. Powell, the Fed chairman, in a speech this month discussed the possibility that the strong economy could spur productivity growth but called the evidence for such an idea “sparse and inconclusive.”

A robot loading boxes onto pallets. The spread of electric power in the 1920s and the rise of personal computers in the 1990s paved the way for productivity gains, leading to higher pay and faster growth. Andrew Spear for The New York Times

For now, the Fed appears to be sticking with the standard approach of gradually raising rates to ward off inflation. But the United States may be about to run an experiment on the effects of a high-pressure economy whether Mr. Powell wants to or not. The combination of tax cuts and government spending increases is adding fuel to an economy already burning hot. The Fed's most recent projections estimate that the unemployment rate will fall to 3.5 percent next year.

If that happens, the beneficiaries could be people like Mike Steffel. Mr. Steffel, 39, grew up near here and never went to college, instead finding work in various low-paying factory jobs. In one position at a local manufacturer, he found himself drawn to the work done by skilled toolmakers.

"I saw what the journeymen were doing there, and I thought that was something that I'd like to be doing as a career," Mr. Steffel said. "You have this raw stock of steel that's just sitting there, and making it into something useful, I like the thought of that."

Eventually, Mr. Steffel saw an ad from APT saying it was hiring and would pay for classes at the local community college. Mr. Steffel works at APT as an apprentice during the two-year certificate program, and is committed to staying a year after it ends. In return, he gets training as a toolmaker, a skill that could ultimately earn him more than \$70,000 a year with overtime. And the skills he is gaining are less easily replaced by robots.

"This is the career that I have chosen," Mr. Steffel said. "I'm not going to get rich off it, but hopefully in the end I'll do well."

For Mr. Nighswander, training people like Mr. Steffel is an investment. For years, he said, he complained that the people graduating from local high schools and colleges didn't have the skills needed. But eventually he realized that he had to tackle the problem himself.

In 2015, APT opened a training center inside its 75,000-square-foot headquarters. Every afternoon during the school year, eight to 10 students from the local high school spend two hours taking hands-on classes in electrical engineering, machining, practical math and other subjects. The students earn school credit, and many also work at APT after hours.

Mr. Nighswander acknowledged that many trainees would never work at APT after graduation. Some may even work for his competitors. But when skilled labor is scarce, he said, companies have to start taking matters into their own hands.

“There’s a whole bunch of gearheads out there, and there always have been, and they’re smart,” Mr. Nighswander said. “If manufacturers are not willing to invest in education, then the only thing they can do is steal an employee from another employer.”

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