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As Skill Requirements Increase, More Manufacturing Jobs Go Unfilled

Number of open positions highest in 15 years, with many workers not possessing skills to do today's jobs



Employees install panels on airplane wings at the Boeing Co. manufacturing facility in Renton, Wash., last year. PHOTO: DAVID RYDER/BLOOMBERG NEWS

By **ANNA LOUIE SUSSMAN**

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Amid growing anxiety about the disappearance of factory jobs, thousands of them are going unfilled across the U.S.

The number of open manufacturing jobs has been rising since 2009, and this year stands at the highest level in 15 years, according to Labor Department data.

Factory work has evolved over the past 15 years or so as companies have invested in advanced machinery requiring new sets of skills. Many workers who were laid off in recent decades—as technology, globalization and recession wiped out lower-skilled roles—don't have the skills to do today's jobs. The mismatch poses a growing problem for the economy, stymieing the ability of businesses to increase production and weighing on growth, executives say.

Gary Miller has observed manufacturing's evolution firsthand. When he started at Ohio-based Kyocera SGS Precision Tools Inc. in 1989, it employed 550 production workers. Despite shedding half its workers, it now produces twice as much, thanks to higher-skilled employees and equipment such as computer-controlled machine tools, which cost up to \$500,000 each.

Mr. Miller, KSPT's director of training, struggles to find technicians with the electrical and mechanical skills needed to maintain the complex machines. One electrical maintenance role went unfilled for over a year as he searched for someone with an associate's or bachelor's diploma, ideally in manufacturing engineering.

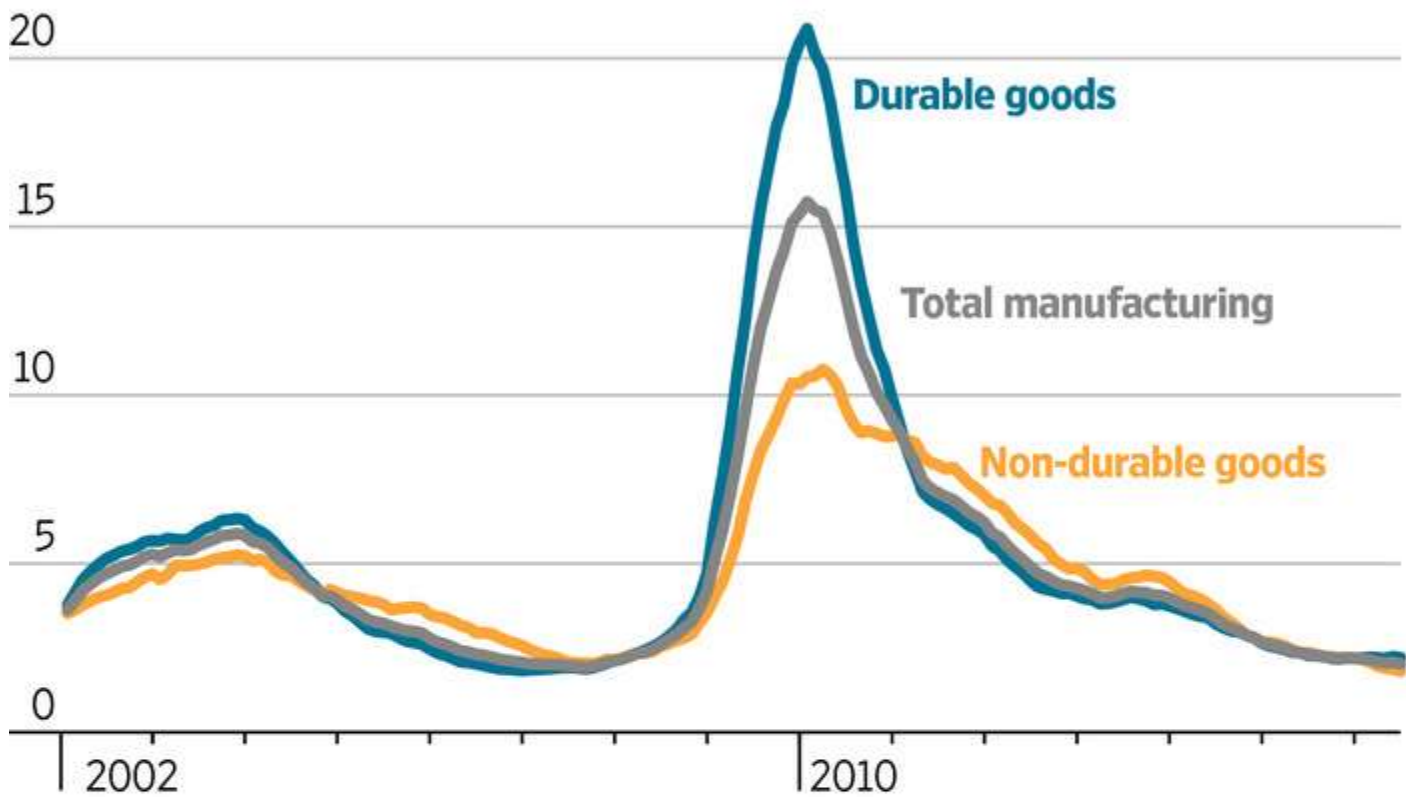
“Back 15 years or so, the machines weren't as sophisticated as they are now,” he said. Having that job unfilled put “a very big impact on our bottom line.”

Help Wanted

The ratio of unemployed manufacturing workers to job openings has declined in recent years. But employers say many workers don't have the skills for the modern factory, as overall skill requirements in the sector have risen.

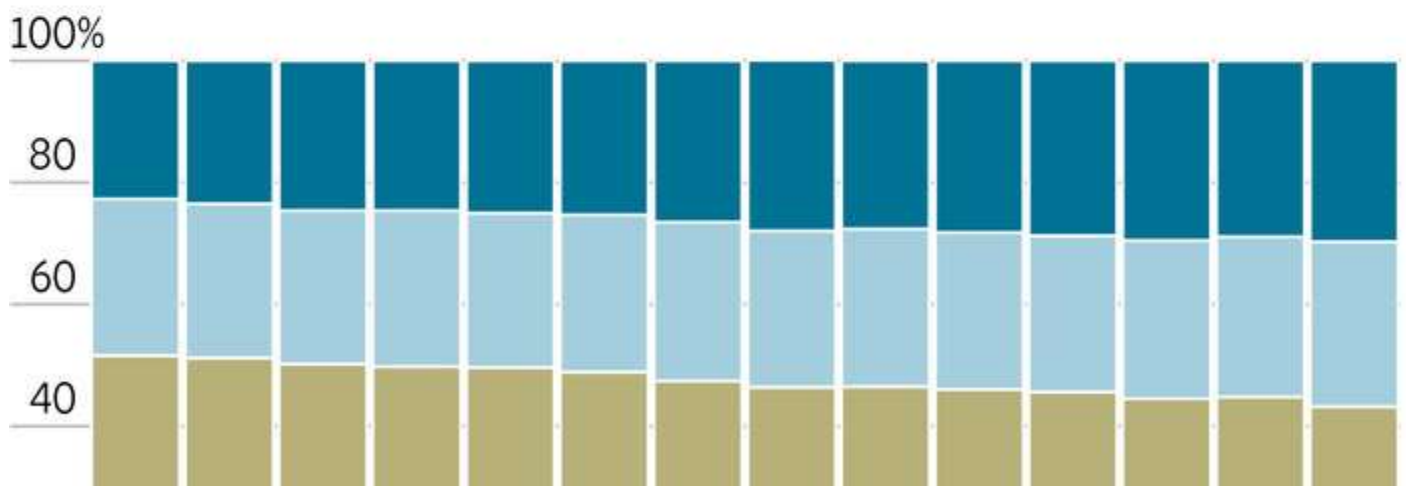
Unemployed workers per opening in the manufacturing sector

Based on 12-month moving average, January 2002–June 2016



Educational attainment among manufacturing sector workers

■ High school or less ■ Some college ■ Bachelor's degree or higher



His problems are mirrored across the country. Openings for manufacturing jobs this year have averaged 353,000 a month, up from 311,000 in 2015 and 122,000 in 2009.

As manufacturing has become more technology-driven, its share of managers and professionals has risen, according to the Labor Department. In 2000, 53% of manufacturing workers had no education past high school. By 2015, that share had fallen 9 percentage points, while the share with college or graduate degrees increased 8 points.

Research-intensive sectors, such as pharmaceutical or aerospace manufacturing, often seek candidates with science and engineering degrees. Other hard-to-fill roles are middle-skill positions, such as maintenance technician, that require education or training beyond high school, like an apprenticeship or a course at community college. Traditional skilled manufacturing jobs, such as die maker or welder, have been drawing an insufficient number of new recruits as the manufacturing industry shrank.

The “upskilling” in the manufacturing sector mirrors a broader bias in the economy toward more educated workers. In 2016, college-educated workers for the first time outnumbered workers with a high-school diploma or less, according to a study by Georgetown University’s Center on Education and the Workforce.

Companies say education and training systems haven’t evolved alongside industry needs. As manufacturing lost jobs to technology and outsourcing, young people pursued college degrees or jobs in the growing services sector. Colleges and high schools reduced their focus on technical education.

Eight in 10 manufacturing executives said the growing skills gap will affect their ability to keep up with customer demand, according to a 2015 survey by Deloitte and the Manufacturing Institute, an industry-backed nonprofit. It takes an average of 94 days to recruit for highly skilled roles such as scientist or engineer, and 70 days for skilled production workers, they found.

That is despite a large pool of available labor. Between June 2015 and June 2016, there was an average of two unemployed manufacturing workers for each open position, according to the Labor Department.

The fate of the 1,400 workers set to lose their jobs at Indiana’s Carrier plant illustrates the shift. After the Indianapolis manufacturer of gas furnaces and fan coils said it would move jobs to Mexico, Republican presidential nominee [Donald Trump](#) made the plant a talking point on the campaign trail, promising to curb future outsourcing by imposing harsh tariffs and renegotiating trade deals.

Chuck Jones, president of United Steelworkers Local 1999 in Indianapolis, said [Boeing](#) Co. in Seattle, hungry for skilled tradespeople—tool and die makers, and electricians—was offering \$35 an hour plus help with relocation costs.

But he estimates there are 60 Carrier employees who would be eligible. Most of the others are assembly-line workers with little training beyond high school.

With workers—and the institutions that educate them—slow to adapt, executives like Mike Magee, president of Akron Tool & Die Co. in Ohio, spend months searching for candidates. He has had three or four machinist jobs open since the beginning of the year, positions that command \$23 to \$25 an hour for an experienced candidate.

“The machinists we hire have to have a very high skill set,” he said. Filling those roles would allow a second production shift, boosting annual sales to between \$6 million and \$7 million, from under \$5 million today, he estimates.

Some say there is a simple solution: pay more.

“No one says, ‘We can’t find the workers we need even though we raised wages significantly,’” said Brad Markell, executive director of the AFL-CIO Industrial Union Council. “If there’s a scarcity of something, you raise wages.”

But companies say it isn’t that simple. Mr. Magee, at Akron Tool & Die, said he would lose a bidding war to bigger firms in his area, and it won’t solve the problem of too few skilled workers.

Instead, he and others aim to lure a new generation through apprenticeships, field trips to factories, and partnerships with schools that highlight manufacturing’s innovative nature and career possibilities.

But the opportunities aren’t even across the manufacturing landscape. Sectors with high-margin products, such as pharmaceutical or medical device manufacturing, can often afford to pay more than makers of more traditional manufactured goods such as heavy machinery.

Those salary differentials were among the reasons Brandon Lamoncha, sales manager at family-owned Humtown Products, a Columbiana, Ohio-based supplier to the metalcasting industry, lost one of his most gifted engineers—his brother.

Unable to find a replacement with his brother’s computer-aided design skills, he is training one of his current employees in the software after his brother left for what he saw as a more exciting and lucrative role with a medical-device manufacturer.

Mr. Lamoncha said he and his family were sad to see him leave, but encouraged him to take the offer.

“We’d love to keep you, but we can’t afford you,” they told him.

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