

## END OF CHEAP LABOR

## Levi Strauss and other global brands are revamping as wages rise and robots multiply

By Kathy Chu and Bob Davis

HONGSHAN, China—Thirty years ago, Levi Strauss & Co. began producing its iconic jeans in China, eager to tap a seemingly endless stream of workers willing to sew for a few dimes an hour. Now that stream is starting to dry up.

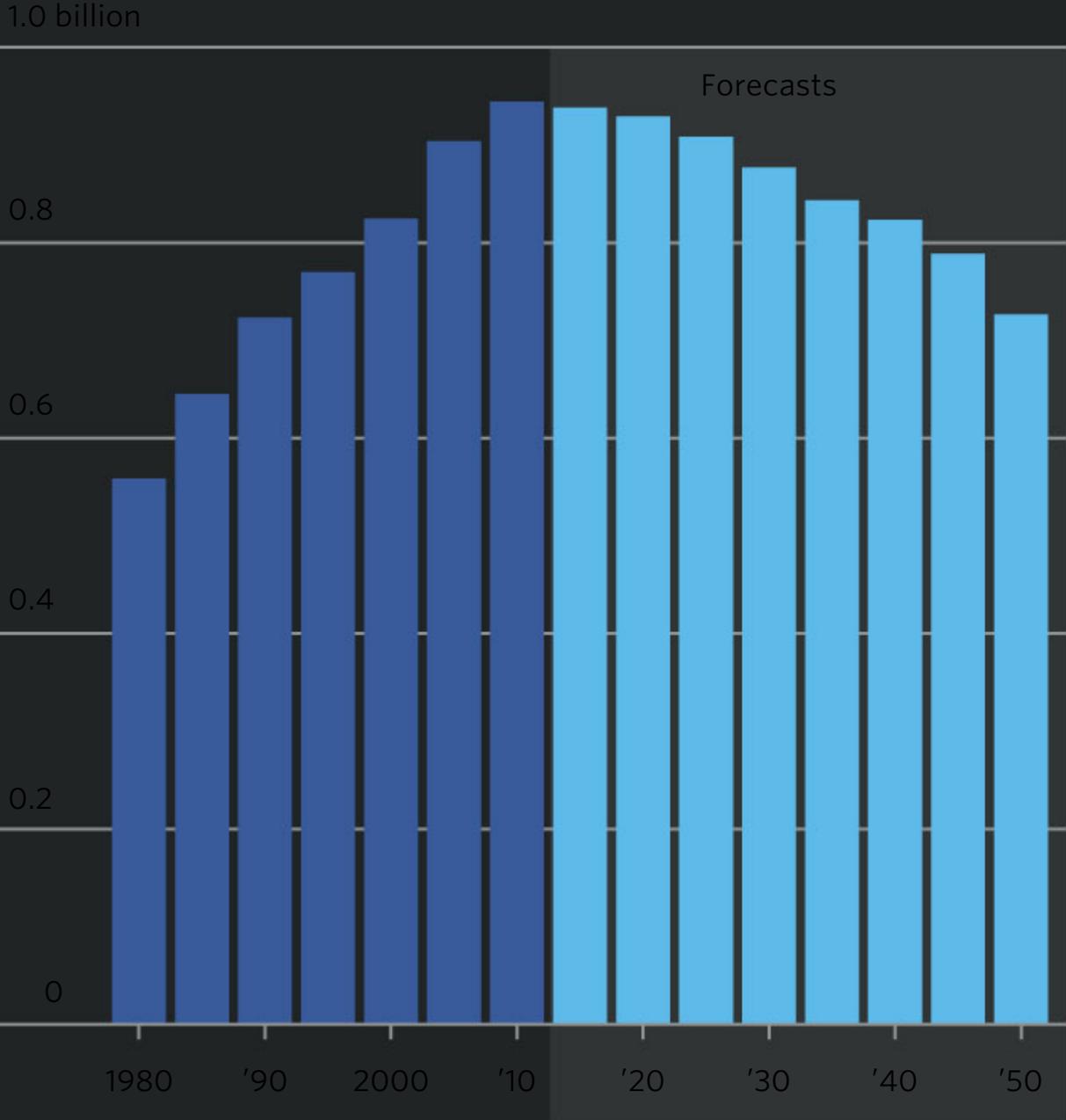
Over the coming decades, a labor shortage will force Levi and scores of other Western brands to remake their China operations or pack up and leave. The changes will mark a new chapter in the history of globalization, where automation is king, nearness to market is crucial and the lives of workers and consumers around the world are once again scrambled.

The stirrings of change are visible already. In an apparel factory in Zhongshan, a gritty city of three million stuffed with industrial parks across the Pearl River from Hong Kong, lasers are replacing dozens of workers who scrub Levi's blue jeans with sandpaper to give them the worn look that American consumers find stylish. Automated sewing machines have cut the number of seamstresses needed to stitch arc designs into back pockets. Digital printers make intricate patterns on jeans that workers used to do with a mesh screen.

“Labor is getting more expensive and technology is getting cheaper,” says Andrew Lo, chief executive of Crystal Group, one of Levi's major suppliers in China.

Labor Outlook

China's working-age population, ages 15-59, is starting to shrink.



Source: United Nations

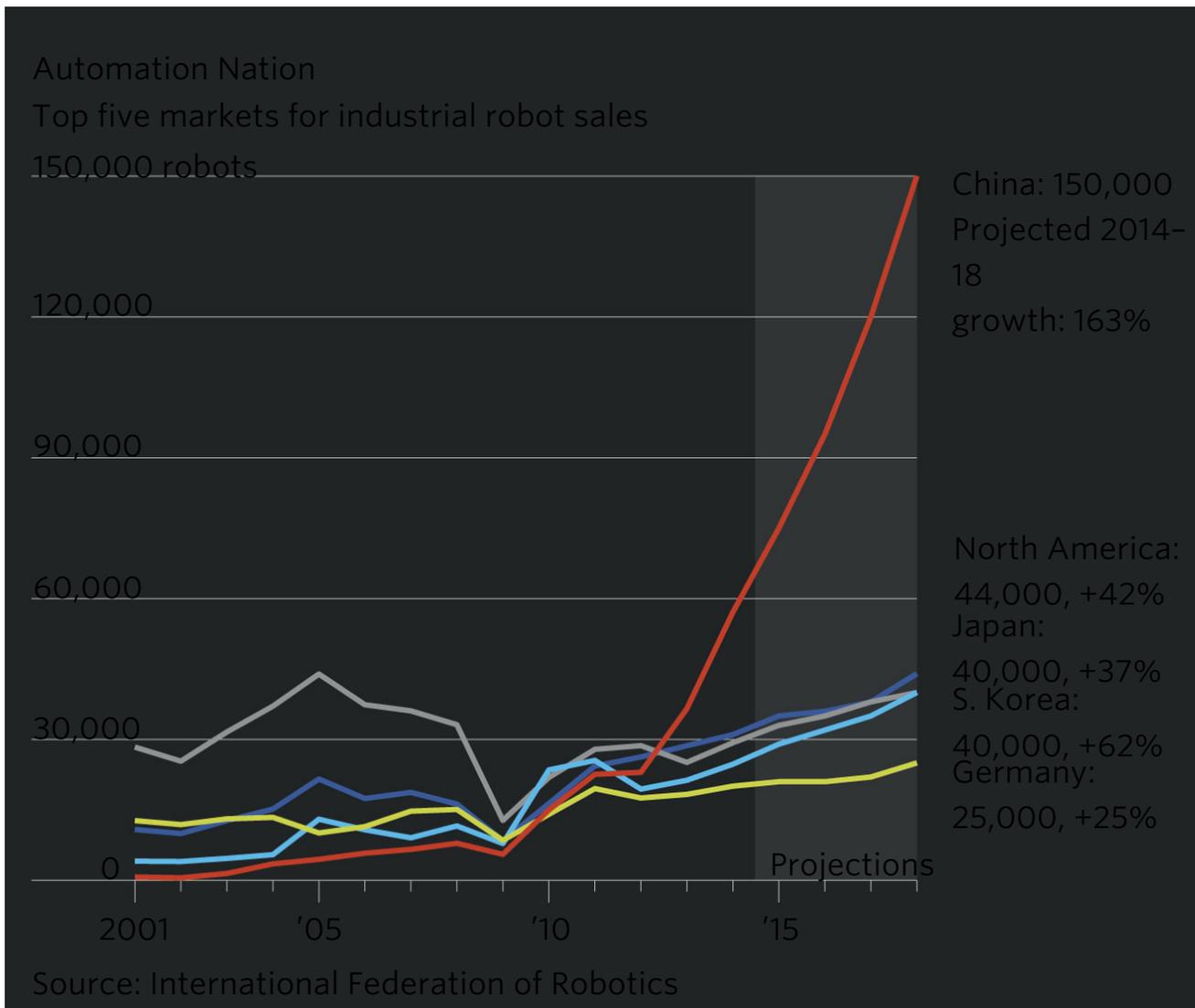


A worker checks the stitching on jeans at Crystal Group, a major supplier to Levi Strauss & Co., in Zhongshan. *PHOTO: GILLES SABRIÉ FOR THE WALL STREET JOURNAL*

While China's economic downturn is providing some respite from the labor crunch, Crystal's blue-jeans factory here still pays 20% above the market rate. It organizes cooking classes and singing contests to keep workers happy.

Last month, China announced it was abolishing its decades-old policy restricting most couples to one child. But that won't likely put much of a dent in the country's looming demographic problem because relatively few Chinese prefer to have more than one child, economists note—and it will be at least 16 years before any additional babies make it to the job market.

Fearing that China will see an exodus of manufacturers, Chinese Communist Party Chief **Xi Jinping** (<http://topics.wsj.com/person/J/Xi-Jinping/6475>) last year called for “an industrial robot revolution” in China, which has become the world's largest market for automation.



Looking ahead to 2050, the future appears mixed for consumers around the globe. Low-cost production in China has helped suppress inflation in the U.S., Europe and at home. It is an open question whether automation can hold down costs as effectively as Chinese peasant labor did. But consumers should look forward to more choice, faster delivery and, perhaps, less harm to the environment.

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Some technologists even think that inventions such as 3-D printing—essentially printers that replicate solid objects like copiers reproduce printed pages—will have a big impact by 2050. In such a world, printers could spew out clothing, food, electronics and other goods ordered online from a nearly limitless selection, with far fewer workers involved in production.

“In 2050, you could potentially have a 3-D printer at home that could produce all the fabrics you want,” said Roger Lee, the chief executive of Hong Kong’s TAL Group, which makes 1 of every 6 dress shirts sold in the U.S. for brands from Banana Republic to Brooks Brothers. “That would make us obsolete.”



A garment worker in Zhongshan watches a television show on a smartphone before leaving for the night shift as her friends hang out on the street. PHOTO: GILLES SABRIÉ FOR THE WALL STREET JOURNAL

The end of very cheap labor in China is giving a push to these advances in technology, which will make China less central to global manufacturing. But changing consumer tastes—enabled by the same technological change—are diminishing China’s role too.

Consumer demand is growing for customized goods, whether they are pharmaceuticals tailored to individual genes or craft beers tailored to individual palates. That makes distance from market an increasing disadvantage, especially ordering huge quantities of goods from China and waiting a month for delivery by ship. Factories are likely to get smaller and more dispersed, so they are closer to customers, wherever they live.

“Logistics, taxes and marketing may become more expensive compared to labor costs,” said Gary Hufbauer, a trade expert at the Peterson Institute for International Economics. “All that would make China less attractive.”

Examining the choices faced by Levi, whose history traces the course of globalization, provides a window into the challenges and opportunities presented by China’s demographic transition. The 162-year-old company manufactured solely in the U.S. until the 1960s, with its jeans becoming a symbol of the American West, sought by teenagers the world over.

Levi first began production overseas in Hong Kong in 1966. In the following decades it expanded production in Mexico, Europe and Asia, as low-cost countries competed for foreign investment. During the early 1980s, demand for jeans declined, and the San Francisco company laid off a third of its global workforce, according to a Harvard Business School study, and moved more aggressively overseas to cut costs. In 1986, Levi started to shift its production to China.

In recent years, privately held Levi has overhauled its supply chain to squeeze out costs and revive a business that analysts say was late to trends such as colored denim. Levi’s revenue has grown each of the past two years, reaching \$4.75 billion in fiscal 2014, but pales compared with the company’s \$7.1 billion in revenue at its peak in 1996.

“We are moving toward agility,” says Liz O’Neill, Levi’s senior vice president of product development. “The real money is having the right product in front of the customer at the right time.”

China’s rise to the world’s No. 2 economy relied on a huge increase in the

## The Evolution of Levi's Jeans

Levi Strauss first patented its blue jeans in 1873. In the past 140-plus years, it has embraced many innovations to make its jeans with less manpower.

1890: Calico 1890 jean



\*Levi's price  
†In 2015 dollars

Now: Levi's 501CT



1915: Levi demonstrates first application of an assembly-line process in the apparel industry.

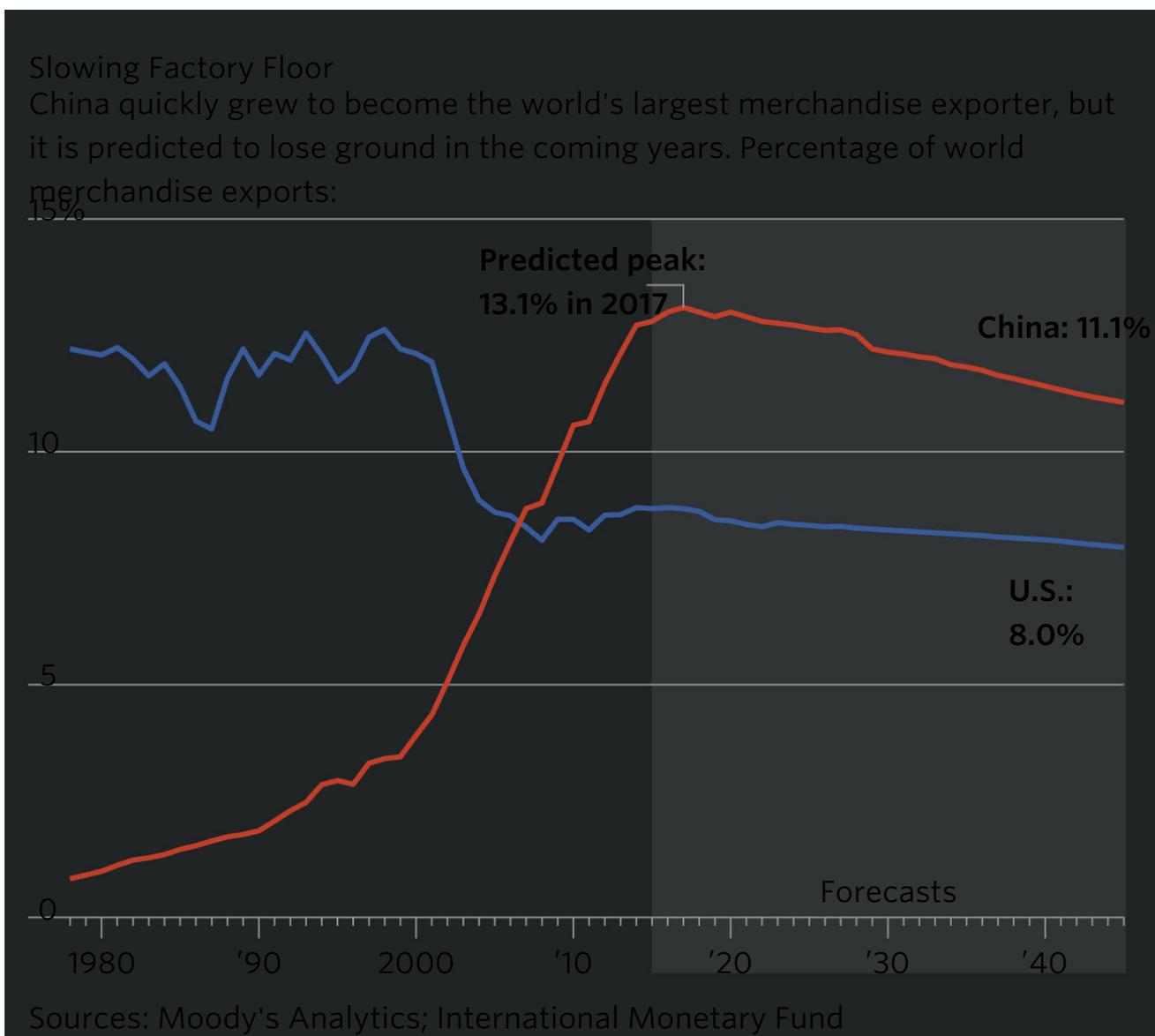
1988: Computerized pattern making first used for Levi's jeans.

Mid-to-late 1990s: Levi starts experimenting with lasers to make jeans look faded and distressed. Years later, it expands its use of lasers to create vertical striations on jeans and to make stretch fabric look more like traditional denim.

country's working-age population, which expanded by 380 million people between 1980 and 2015. In one of history's greatest migrations, hundreds of

millions of rural Chinese headed for cities for manufacturing jobs that were a step up from peasant labor, even though the work paid poorly by global standards.

China's foreign shipments rose about 6,700% between 1980 and 2007, when China surpassed the U.S. as the world's largest exporter. Manufacturers who had been automating U.S. and European factories to shave labor costs stopped once they set up in China. "Machines couldn't compete," says David Love, a Levi executive vice president. As late as 2002, Chinese labor costs were just 60 cents an hour, according to the Conference Board, a business research group.



But China's working-age population recently peaked, and its so-called demographic dividend has started to turn into a demographic drag. By 2050, the working-age population will decline by 212 million, estimates the United Nations—roughly as many people as live in Brazil, the world's fifth most-populous nation.

Wages and benefits have already been rising in double-digit percentages for the past decade as workers can command higher rates. Although wage growth may ease this year because of the economic slowdown, the pressure is bound to increase in coming decades as the number of workers plunges.

### Scenes From the World's Factory Floor »



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Outside the Zhongshan factory that makes Levi's jeans, a white banner tells potential workers that "no experience is necessary" and promises bonuses for new recruits.

In Nansha, a manufacturing hub 30 miles north of Zhongshan, rising salaries over the past decade have made it possible for Li Yu, 28, to buy a modest house.

“There are many different opportunities today,” says Mr. Li, who repairs machinery that assembles circuit boards. “I’d like to do something I’m good at. Of course, if there’s a better opportunity, I will take it.”

Adding to the shortage, many factory workers will be drawn back to their hometowns to take care of the growing ranks of Chinese older than 60, whose share of the population is forecast to double by 2050 from 2015, to 36.5%.

“I really want to go home,” said Fu Yingjiang, 32, a laborer from Hubei province who has been working in factories in Zhongshan and elsewhere for 10 years. Awaiting him are a wife and two children, along with his blind mother and terminally ill father.

Already, China’s rising labor costs—now \$14.60 an hour on China’s coast, adjusted for productivity, compared with \$22.68 an hour in the U.S., according to the Boston Consulting Group—have diminished China’s competitiveness. Adding energy costs, China is now a more expensive place to manufacture than Indonesia, Thailand, Mexico and India, says BCG.

None of this means Levi is going to abruptly pull up stakes. Levi lists about 200 Chinese factories where it does business, five times as many as any other country.

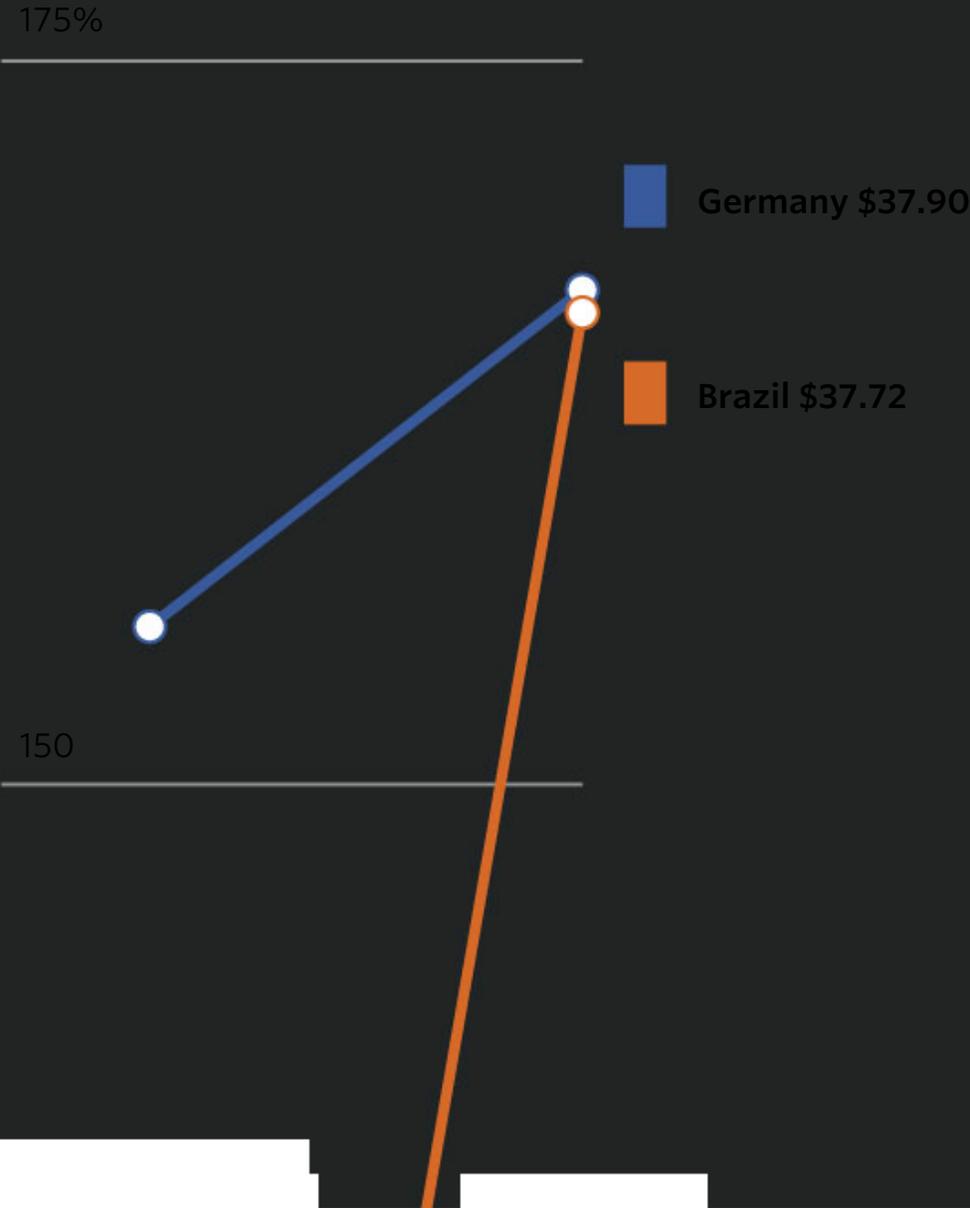
Levi is adapting its laser technology so it can etch different patterns to make one type of denim look like another, reducing costs by buying less fabric. For a new line of women’s wear, Levi said it needed only 12 fabrics, rather than 18. In the past three years, Levi said, it cut the number of its suppliers by 40% and the number of fabrics by 50%.

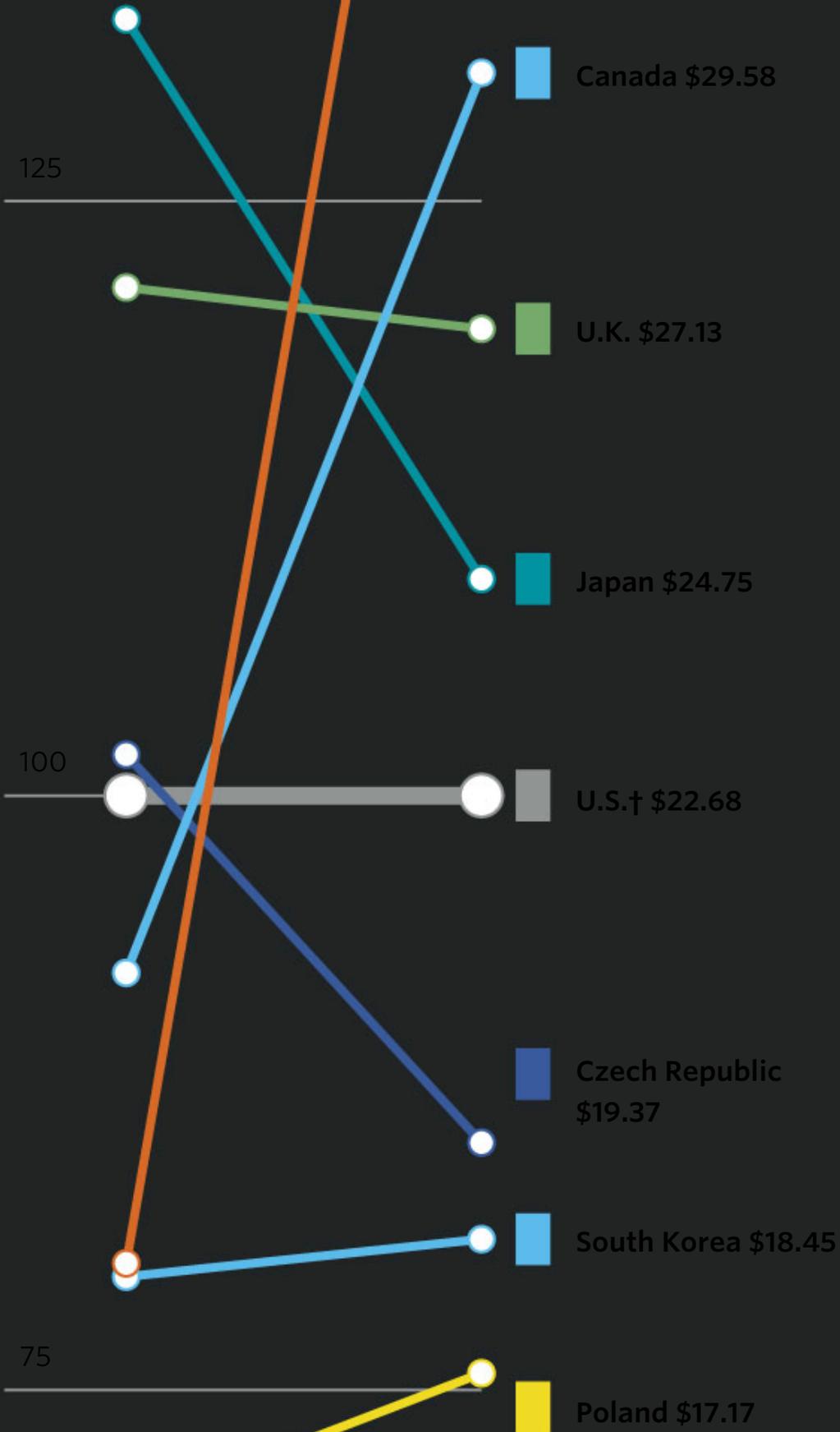
The changes also give Levi greater flexibility, said Ms. O’Neill, the 44-year-old executive who helps oversee the company’s supply chain. If a pair of jeans using a particular fabric is selling well, she says, Levi can use lasers to produce more of the desired look, and pare back designs that are losers. “The idea is to delay decision-making for as long as possible,” said Ms. O’Neill.

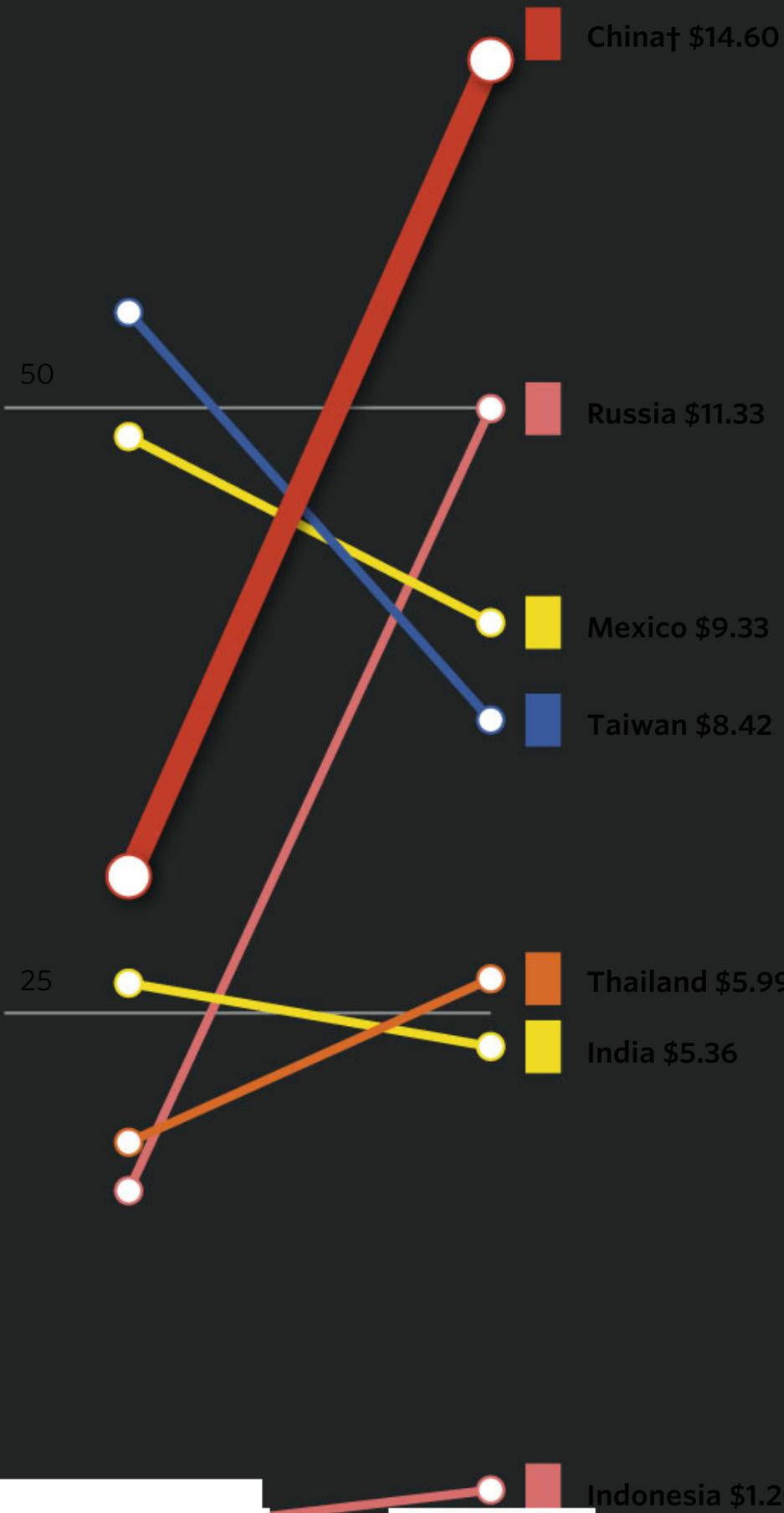
Levi executives say they have largely abandoned a strategy of relocating

### Pricier China

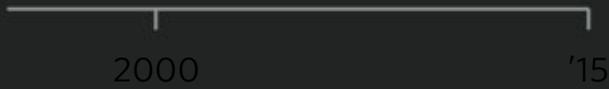
Manufacturing labor costs per hour\*, adjusted for productivity, as a percentage of U.S. wages each year







0



2000

'15

\*Including wages and benefits

†For the largest manufacturing regions (Yangtze River Delta in China and Southern states in the U.S.)

Source: Boston Consulting Group

production to one impoverished country after another, known as “chasing the needle,” in favor of other forms of cost-cutting.

Even so, to stay competitive, says Mr. Love, the executive vice president, Levi turns to lower-wage countries like Cambodia to produce some plain jeans that are cardboard stiff and require little processing. Levi is also checking out African countries where wages are low and the population, unlike China’s, is youthful and growing. The company isn’t convinced yet that Africa’s infrastructure is up to snuff.

Levi faces other challenges producing in China. It takes about 30 days to ship jeans by sea and land from China to Hebron, Ky., a big Levi distribution center for the U.S., long enough for Levi to miss changes in fashion and get stuck with unwanted inventory. McKinsey & Co. says the next big change in manufacturing is “mass customization,” or responding to individual consumer preference. Shoppers already can pick from thousands of designs and fits of clothing on e-commerce sites, a practice that is likely to increase over the coming years as consumers use scanners to upload their body measurements.

For China and the companies that do business there, these changes threaten to remake the traditional manufacturing model where goods are produced in huge runs in China’s coastal cities and shipped thousands of miles by sea. Instead, technologists expect a profusion of smaller factories over the coming years,

designed to meet local preferences. Moody's Analytics, in an analysis for The Wall Street Journal, forecasts that the U.S. trade deficit with China will diminish and turn positive by 2042, in good measure because of these changes.

Levi is already experimenting with more localized production. When a line of so-called skinny jeans, which it made in China, became a big hit in Europe, it turned to factories in Poland and Turkey to fill the unanticipated demand and cut shipping time, said Ms. O'Neill.



Students at the Honghua Training beauty school do a nightly dancing routine near a restaurant frequented by factory workers. *PHOTO: GILLES SABRIÉ FOR THE WALL STREET JOURNAL*

In the U.S., Levi produces its “vintage” jeans. The company uses lasers and other techniques to reproduce the wear patterns of jeans that cowboys and miners once wore and which Levi preserves in tissue paper at its headquarters archives.

Levi used Mexican plants to produce some of its most high-fashion women's jeans—ones with patched-up holes and complex stitching—when it noticed that U.S. women were patching jeans on their own because they liked the look.

Mexico is only four days by truck from Levi's Kentucky distribution center.

These days in hilly, arid Torreon, Mexico, Apparel International Inc. is counting on China's shrinking working-age population and rising wages to gain an edge. Fifteen years ago, the big jeans maker halved its workforce of 6,000 because it couldn't compete with China. Now it is modernizing aggressively.

The company's impish 58-year-old research director, David Reyes, who wears his long gray hair in a ponytail, hangs jeans on a conveyor belt in a big ultraviolet ray chamber to replicate the look of sun bleaching. "My grandmother used to toss my jeans on the top of the roof," he recalls. "The sun bleached them yellow." He wants to produce a similar tint—and interest Levi in producing such jeans in Mexico.

Levi said it expects China production to rise only "modestly" next year; new orders are up for grabs. Apparel International's president, Oscar Gonzalez, says the company now boasts an advantage over China—a large pool of apparel workers who were laid off in past downsizings. Excess labor has helped him keep wage increases to 2% or 3% a year he says.

"Every Monday when we recruit," he adds, "there are long lines of applicants."

Illustrations: Jimmy Turrell

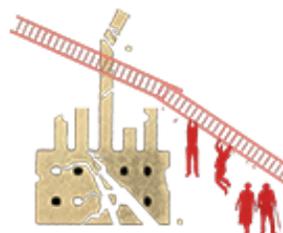


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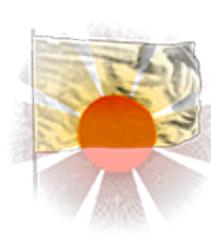
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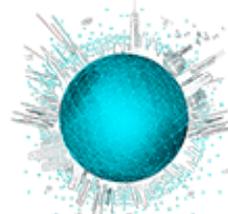
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End of Cheap Labor | As China's Workforce Dwindles, the World Scrambles for Alternatives

By **KATHY CHU** and **BOB DAVIS**

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