Coming Home?

Thanks to some recent trends, more companies are giving the U.S. a serious look as a manufacturing location.

By Merrill Douglas

Chinese computer manufacturer Lenovo opens a plant in North Carolina. General Electric shifts a water heater factory from China to Kentucky. Ford announces plans to create 12,000 hourly jobs in the U.S. by 2015. Brooks Brothers locates 70 percent of its men’s suit production in Massachusetts.

Do these moves add up to a movement? Or how about these figures?

A 2012 survey of 340 U.S. companies by the MIT Forum for Supply Chain Innovation and Supply Chain Digest finds that 15.3 percent of respondents have decided to bring some production back to the U.S., with another 33.6 percent considering such a move. In June 2013, the U.S. Commerce Department reports that the nation’s trade deficit has dropped to the lowest point since October 2009. And in August 2013, Boston Consulting Group predicts that by 2020, gains in U.S. exports, plus the return of manufacturing from China, will produce 2.5 million to 5 million American jobs.

After decades spent shipping production overseas — building plants in lower-wage countries or outsourcing to foreign-owned plants — are U.S. companies reversing that trend? Have we arrived at the verge of a reshoring renaissance?

The answer isn’t clear, and of course the factors that determine where companies make their products are varied and complex. But among many observers, there’s a growing sense that, at least for certain kinds of companies and products, a return to American shores might be the wave of the future.

“I won’t say that it’s a tsunami running back toward the U.S.,” says Bruce Stirling, MBA ’73, a supply chain consultant with Cincinnati Consulting Consortium. But as manufacturing overseas, especially in China, gets more expensive, and as companies discover other drawbacks to offshoring, “the tide has started to turn.”

Why the change?

Stirling has seen this phenomenon firsthand — for instance, in the case of a U.S. consumer products firm that bought plastic parts from one of his clients in Canada. The Canadian supplier lost a large chunk of business when the consumer products company decided to procure parts in China instead.

“Shortly after it made the offshore move to China, the consumer products company encountered rising transportation costs, longer-than-promised lead times, and significant quality issues,” says Stirling. The Chinese supplier also had trouble matching production to seasonal demand. “Nominal savings were wiped out by the unexpected costs and complications,” he says. Eventually, the U.S. firm returned much of that business to North America.

At Lenovo, the company’s decision to open a plant in Whitsett, N.C., is part of a move toward regionalization, a strategy that involves positioning itself as a “global-local” company.

“For particular markets that we’re attacking, we want to have speed, flexibility, and good will,” says Keita Broadwater, MBA ’03,
senior manager of operations at Lenovo in Beijing. With a plant in the U.S., Lenovo can serve that market fast, and it gains the flexibility it needs to offer customized products to American customers, he says. “As for good will — having it made in the USA is a plus when you’re selling to the U.S. market.”

Among those who believe that U.S. manufacturing is ready to rebound, though, one of the most-cited explanations is the rising cost of labor in China.

That country gained its position as factory to the world thanks largely to a vast pool of skilled workers who earn far less than their counterparts in the West. But the gap between wages in China and the U.S. has narrowed in recent years. That’s made the argument for offshoring — at least to China — less compelling.

Factory workers in China used to earn one-tenth to one-fourteenth as much as their American counterparts, says William Drislane ’82, MEng ’83, MBA ’84, vice president of engineering at Dragon Innovation, a Boston-based consultancy that works with technology hardware manufacturers. “Today, labor rates in China are probably one-fourth to one-sixth of what they are in the U.S.”

Although that leaves labor in China still somewhat cheaper than in the U.S., labor also has come to count much less in the total cost of manufacturing of certain products. The reason is advanced automation, which makes it possible to turn out massive volumes of product while keeping payrolls small.

For example, a September 19 story in the New York Times cites Parkdale Mills, a textile factory in Gaffney, S.C., which spins 2.5 million pounds of yarn a week with just 140 employees — volume that would have needed more than 2,000 workers in 1980.

“Spending a lot of time and effort, and accepting risk by moving your production offshore, is getting you less and less benefit, because labor as a function of the total product cost is not as significant as it used to be,” says Doug Merrill ’89, MEng ’90, MBA ’91, a veteran supply chain professional. Merrill is co-founder and chief operating officer of Sunward Systems, which makes solar water heaters in Shelburne, Vermont.

Of course, for industries that are still labor-intensive, reshoring isn’t the only possible response to higher Chinese wages. “A lot of colleagues in other companies have told me they’re looking at moving manufacturing from China to Vietnam, for example, or Malaysia,” says Broadwater. That’s an easy enough move for electronics firms, because Southeast Asia offers plenty of good sources for components.

But moving in search of lower wages isn’t feasible for every product. “In addition to having the labor force and factory buildings, you have to have a whole community of subsuppliers that can provide parts,” Broadwater says. “Or you have to have a very efficient logistics model, so you can get parts quickly and reliably.”

Not every spot on the map can boast a critical mass of suppliers, or suitable roads and ports.

Heightened risk, hidden costs

Even if a company finds the right ecosystem overseas, if it races to foreign shores without due deliberation, it may well stumble over other obstacles. With the recent rise in fuel prices, for instance, the cost of shipping components or finished goods halfway around the world may cancel out the benefits that low-wage countries provide.

“The only way that incredibly long and complex supply chains are possible is if transportation prices — meaning fossil fuel prices — are low, and if interest rates are relatively low, so money doesn’t lose value over time,” Merrill says.

Shipping products over long distances also increases the risk of supply chain disruption, says L. Joseph Thomas, associate dean of academic affairs, professor of operations management, and dean emeritus. To offset that risk and make sure they have enough product to meet customer demand, companies keep extra inventory in their distribution centers and bear the carrying costs.

“The higher the value of the product, the more likely you are to want a short supply chain, because the inventory costs more,” Thomas says. And the more discerning the customer, the more a company profits by providing excellent service, he says. It’s easier
To hear some people tell it, the technology called three-dimensional printing could one day put the global supply chain out of business.

A 3D printer sets down layer after layer of a powdered or liquefied substance — a plastic or metal, for example — to build a three-dimensional object based on a set of design instructions. The technology isn’t new, but it has recently grown capable and cheap enough to set people dreaming of a day when 3D printers will become as ubiquitous as microwave ovens.

“Missing the battery cover on your remote control? Print one,” wrote reporter Steven Overly in the Washington Post in July. With a machine like that in every home and office, the theory goes, there’s no need for factories with thousands of workers on the payroll. And so there’s no need to manufacture in low-wage countries.

Consumers with desktop printers aren’t about to replace traditional production lines any time soon, experts say. But in the near term, 3D printing could change the way companies make certain products — and where they make them.

Manufacturers today use 3D printers mainly to create prototypes. “Ninety percent of what we use 3D printing for is to get a sense of the physical size and shape of a product we’re designing,” says Adam Hocherman ’97, MBA ’06, and president of American Innovative, a consumer electronics firm based in Beverly, Mass.

Since tweaking a design on a 3D printer means simply modifying the electronic design file in the computer, rather than paying a shop to cast new molds, designers can produce prototypes in as many iterations as they need, with little effort and at a relatively low cost.

Once American Innovative perfects a design, it produces the item by conventional means in China. Three-dimensional printing won’t become practical for large-scale production until it can turn out objects as fast as injection molding, and with the same high-resolution surface, Hocherman says.

When companies do use 3D printing for full-scale production, they generally use it to make components rather than complete products, says Hod Lipson, associate professor in Cornell’s School of Engineering and co-author of Fabricated: The New World of 3D Printing.

Just as 3D printing reduces setup costs for prototypes, it provides a similar advantage for complex parts, highly customized parts, or parts that are sold in fairly small numbers. For U.S. companies that make those kinds of components — or want to — 3D printing could well inspire a move back home from overseas, according to Lipson.

“Often, companies would prefer to custom-make parts or make them in short runs, but given the economics of mass production, they have to make them in large quantities,” Lipson says. They stick with a few standard versions of the product, and they keep costs low by making components in low-wage countries.

“But if you had a tool that could make things in short batches and complex shapes, you would use that,” Lipson says. The low setup costs would offset the wages paid to the few employees needed to manage the printing process — so the company could make the product anywhere. “3D printing might allow them to abandon mass production and go back to what really makes sense for that product.”
to respond quickly and nimbly to customer demand when you manufacture close to your market.

That’s certainly the case for Sunward Systems. The assembly operation in Vermont chooses components to fit each customer’s individual needs. About 90 percent of the parts for its water heaters come from North America, mainly from Halifax, Nova Scotia.

As a small firm, Sunward can’t afford to tie up capital in goods that are sitting in an overseas plant, on a dock, or in a ship, Merrill says. Sunward’s push for continual innovation — bringing a new generation of product to market about every six months — also makes a long supply chain a risky proposition. “If we upgrade a component in our system, the last thing I want is to have three containers’ worth of material that’s no longer compatible.”

Other aspects of a long supply chain — a 12- or 13-hour time difference, a language barrier, and disparate business and cultural norms — complicate communications with overseas partners, and complexity imposes hidden costs, Drislane says. Also, a company that outsources to Asia must keep an office and staff there or hire a firm such as Drislane’s to manage relationships with vendors. “We’re cheaper than doing it yourself, but we’re not cheap,” he says.

Vishal Gaur, professor of operations management at Johnson, agrees that outsourcing can prove harder and costlier than companies expect. At manufacturing forums that Johnson sponsored in June 2012 and September 2013, several senior executives made exactly that point, Gaur says. “Even when manufacturing is outsourced, one needs to have feet on the ground to manage the supplier with respect to quality, safety, labor standards, and other issues.”

Worries about poor product quality, theft of trade secrets, and knockoff products have also fueled interest in reshoring. Some U.S. manufacturers bring production home to better safeguard their intellectual property and brands and to minimize supply chain risk, Gaur says.

For other companies, reshoring is part of a broader strategy toward regionalized production. Lenovo pursues regionalization as a marketing strategy, but some companies also view it as a way to reduce supply chain risk. If something disrupts the supply chain, the company can always ramp up production elsewhere to keep meeting demand, says Stirling. “People are willing to take on a little more cost in order to have supply flexibility and to be able to react to local markets.”

When reshoring works, and when it doesn’t

While some observers see an incipient movement back toward U.S. shores, Drislane observes that reshoring isn’t the right choice in every case. “I don’t think it’s fair to call it a trend,” he says. “It’s a measured business practice in certain situations.”

Good candidates for U.S. production include items made in highly automated factories, where labor costs are a minor factor, says Drislane. (Parkdale Mills in South Carolina is a prime example.)

U.S. manufacturing also suits products with complex technology, Drislane says. And keeping production close to home might be a good idea if you need to custom tailor products for different customers. “That can be dealt with overseas, but it’s harder because of communications,” he says.

Domestic production is a good choice as well for large, bulky items such as refrigerators. “You want to at least assemble them locally, or else the transportation cost is too high,” says Gaur.

But reshoring also has potential drawbacks. For instance, it can be hard to find U.S. sources for certain kinds of parts and materials. “Most of the components come from China,” says Drislane of
Doing the right thing: how and where

When the Rana Plaza garment factory in Bangladesh collapsed in April 2013, killing more than 1,000 workers and injuring more than 2,500, that tragedy threw a spotlight on the hazards of outsourcing to low-wage countries.

Other incidents have also sparked worries about sourcing overseas, including a spate of suicides at China’s giant Foxconn factory in 2010 and scares involving tainted baby formula, pet food, and pork products from China. But Western companies — under tremendous pressure to meet customer demand for low-priced goods — have responded mainly by trying to monitor better and mitigate potential problems, not by pulling production back home.

After the Rana Plaza disaster, for instance, about 70 retailers, most of them European, agreed to pay for improvements at factories they use in Bangladesh that don’t meet their safety standards, according to the Wall Street Journal. Large U.S. retailers developed a competing plan that also pledges money for safety improvements but, unlike the European pact, is not legally binding, said the New York Times in July.

Brand owners certainly worry about safety, working conditions, and other matters of corporate social responsibility, says Vishal Gaur, professor of operations management at Johnson. But when an industry concentrates in one region the way factories producing lower-priced garments concentrate in Bangladesh, the local network of suppliers and contractors offering the necessary materials and services grows too important to ignore.

“A company embedded in a supply chain cannot single-handedly make a decision to move elsewhere,” says Gaur. “It has to stay close to its supply base to be competitive.”

One key to socially responsible outsourcing is to work with factories that serve big names such as Hasbro, Intel, and Motorola, says William Drislane ’82, MEng ’83, MBA ’84, vice president of engineering at Boston-based consultancy Dragon Innovation. “There are Chinese factories whose clients are all Western companies, all of whom will drop the factory in a New York minute if the factory is involved in any kind of problem.” When Dragon negotiates contracts with factories on behalf of clients, it writes industry-standard codes of conduct into the agreements, he says.

Although it is feasible to ensure a contractor’s conduct and performance from afar, sometimes a company’s DNA dictates that it keep manufacturing close to home anyway. That’s the case for Pueri Elemental, co-founded by Donna Brin, MBA ’03 (E). Brooklyn-based Pueri Elemental makes Eco-Bonk, an inflatable “bop” toy for young children. Vinyl for the toy’s inflatable unit is milled in Maryland and fabricated in New Jersey. Fabric for the outer cover comes from South Carolina. Pueri Elemental has the cover sewn in North Carolina, printed in a suburb of Chicago, and then shipped to its warehouse in New Jersey to be married up with the vinyl unit.

“This is about as far from practical as you can get,” says Brin. Sourcing in the U.S. is expensive, and the supply chain can get complicated. But she very much wanted to help create manufacturing jobs in this country, she says.

As she works to produce a product that’s safe for children and for the environment, sourcing in the U.S. also allows Brin to stay closely involved in quality control, she says. It’s entirely possible to make a high-quality product in a sustainable manner overseas, she adds. “But for me, it’s about taking a hands-on approach to ensure that I’m producing the best toy that I can — a toy that I’d feel good about giving to my own children.”

Donna Brin, MBA ’03 (E), co-founder of Pueri Elemental, a toy company, sources all the materials and work that goes into making Eco-Bonk, an inflatable “bop” toy for young children, in the U.S. because she wanted to help create manufacturing jobs in this country.
the technology hardware products his clients produce. It’s ten to 15 percent cheaper to buy those products in China than to import them into the U.S.

Not only are suppliers abundant in China, but they cluster conveniently close to one another. “If [they’re] manufacturing in southern Guangdong Province for example, [our clients] can get just about any part they need within 50 miles,” Drislane says.

Like Drislane’s clients, Adam Hocherman ’97, MBA ’06, finds China an incomparable source of components. Hocherman is president of American Innovative, a firm in Beverly, Mass., that designs and manufactures clocks, night lights, and other consumer electronics. He launched the company before he arrived at Johnson, and he credits the expertise he gained in the MBA program, and guidance he received there, with helping him further develop the business.

American Innovative makes all of its products in China, and Hocherman agrees that that country is the best location for producing electronics. “It’s all in one place,” he says. “When I visit my suppliers, we say, ‘Let’s go visit the LED factory,’ and we get into the car and go over there.”

Regrettably, manufacturing at home has never been a viable option for American Innovative, says Hocherman. That said, he adds, outsourcing to China is tough, and startups that don’t gain the right experience and skills or develop the right relationships often fail.

Some of the people behind those failed efforts complain that offshoring yields poor-quality products, Hocherman says. But the blame lies more with the way those entrepreneurs do business than with offshoring itself. “There’s a myth that you can throw something over the fence, and it comes back from China and it’s done,” he says. “It’s nothing like that. It’s an enormous amount of work.”

Along with the allure of a rich supply base, another issue that keeps some U.S. companies producing overseas is a shortage of suitable workers at home. According to a 2011 report by the Manufacturing Institute, manufacturers in the U.S. find it hard to expand, innovate, or increase productivity due to a shortage of trained machinists, operators, craft workers, and others with specialized skills.

Such shortages became another topic for discussion at the Johnson forum in 2012, says Thomas. “A majority of the people at our seminar said this was a real problem for them.”

The nearshoring alternative

Of course, for companies seeking to reduce costs, control risk, and boost flexibility, reshoring isn’t the only option. “Nearshoring” also has become a popular strategy.

Nearshoring means making products for the U.S. market in countries such as Mexico and Brazil, where labor rates are lower than in the U.S. and shipping routes are shorter than from Asia. Many automakers, for example, assemble vehicles in Mexico and then ship them to the U.S. According to a story published Sept. 9 on FTAdvisor.com, Honda, Mazda, Nissan, Audi, and BMW all plan to open new facilities in Mexico and boost auto production there by 35 percent.

“Production in Mexico offers time advantages that are similar to the U.S.,” says Gaur. “It is easier to monitor quality, safety, and labor practices there than on the other side of the globe, and the lead time is almost as short as in the U.S.”

As companies take a more holistic view of the supply chain, some other conditions that might influence where they source or produce include product safety standards, corporate tax rates, energy costs, political pressure, and the level of corruption prevalent in various countries, Stirling says. “I think companies are making much more sophisticated analyses of where they want to locate their manufacturing facilities.”

Given trends such as rising wages in China, high transportation costs, increased factory automation, and greater interest in regionalization, reshoring is likely to remain a hot topic in the coming years. Whether the next wave of U.S. manufacturing sweeps toward our own coast, our neighbors’, or another part of the world, the calculations that propel that wave are likely to grow even more complex than they are today.

Merrill Douglas writes about a wide range of business topics for trade magazines, university publications, nonprofits, and corporate clients, and covers supply chain issues as a contributing editor for Inbound Logistics magazine.