

Industry 4.0: The Future of Competitiveness in U.S. Manufacturing

written by Lauri Moon | September 21, 2016

(Reshoring Initiative Blog — Sandy Montalbano D’Amico: 8-20-16) Industry 4.0 is defined as a fourth wave of technological advancement, driven by nine technology advances that will increase manufacturing productivity and increase competitiveness in manufacturing industries.

According to the Boston Consulting Group (BCG), “In this transformation, sensors, machines, workpieces and IT systems will be connected along the value chain beyond a single enterprise. These connected systems (also referred to as cyber physical systems) can interact with one another using standard Internet-based protocols and analyze data to predict failure, configure themselves, and adapt to changes. *Industry 4.0 will make it possible to gather and analyze data across machines, enabling faster, more flexible, and more efficient processes to produce higher-quality goods at reduced costs.*”

A Level Playing Field

Industry 4.0 has the potential to level the global playing field for U.S. firms and give them the opportunity to reshore more U.S. manufacturing. As American companies adopt a more comprehensive total cost analysis, they are finding that rising offshore labor rates combined with other “hidden costs” of offshoring often counterbalance any remaining savings from cheap price or labor abroad. They are also finding that separating research and development from manufacturing has a negative impact on innovation.

American companies that more accurately evaluate sourcing alternatives and adopt 4.0 technologies will be in an optimum position to increase competitiveness, take advantage of the benefits of localization, and manufacture profitably in the U.S. for the North American market.

The Future of Productivity and Growth

The Fourth Industrial Revolution was the focus of this year's World Economic Forum meeting in Davos. The scope and impact of this industrial revolution is expected to be transformational, and disrupt almost every industry in every country, changing entire systems of production, management, and governance. According to the global agenda, "there is clear evidence that the technologies that underpin the Fourth Industrial Revolution are having a major impact on businesses." A recent BCG report shows how connectivity and interaction among parts, machines, and humans will make production systems as much as 30 percent faster and 25 percent more efficient. Industry 4.0 has the potential to have a dramatic impact on U.S. manufacturing competitiveness and reshoring of U.S. jobs.

The Challenge for the United States

According to the Reshoring Initiative data report, the bleeding of manufacturing jobs to offshore has stopped. Reshoring, including FDI, balanced offshoring in 2015 as it did in 2014. In comparison, in 2000-2007 the United States had a net loss of about 200,000 manufacturing jobs per year to offshoring.

According to Reshoring Initiative calculations, about 265,000 manufacturing jobs have been brought to the U.S. from offshore in the last seven years. That job gain is the result of both new reshoring—the return of manufacturing work by U.S. headquartered companies—and foreign direct investment (FDI) in the manufacturing sector by foreign headquartered companies. Those 265,000 jobs represent about 30% of the total increase in U.S. manufacturing jobs since the recent low of 11.45 million in February 2010.

Now, the challenge is to bring back another 3-4 million manufacturing jobs that are still offshore as measured by our \$500 billion/year trade deficit. □Between the health of the industry overall and the balancing of the job flow, the beginnings of a manufacturing renaissance are evident, but many actions are required to maintain the momentum.

How Modern Technology Solutions and Better Sourcing Decisions Impact Reshoring

We need continuous improvement in operations and in sourcing decisions to make domestic production the clear first choice in more cases.

Corporate Investment

The benefit of Industry 4.0 for U.S. companies is the increased productivity and efficiency that enable more flexible and efficient processes to produce higher-quality goods at reduced costs. The first step then must be continued corporate investment in the nine technologies that are transforming industrial production - the building blocks of Industry 4.0:

- Big data and analytics
- Robots
- Simulation
- Horizontal and Vertical System Integration
- The Industrial Internet of Things
- Cyber Security
- The Cloud
- Additive Manufacturing
- Augmented Reality

Government Action

Second, government action to make the U.S. more competitive: skills training, lower nominal corporate tax rate, and a combination of an overall lower USD and an end of offshore currency manipulation.

Better Sourcing Decisions

Third, consistent, disciplined use of Total Cost of Ownership (TCO) analysis so companies recognize that domestic manufacture is in most cases their best choice.

Reporting Success Stories

Finally, thorough reporting on reshoring success stories so that corporations realize that reshoring is worth reevaluating and investing in ... and so prospective skilled workers realize that their best career opportunities might again be in

manufacturing.

The Winning Strategy

The impact of offshoring on the U.S. economy and the environment has been significant. According to the Economic Policy Institute, the growing U.S. trade deficit with China alone cost 3.2 million jobs between 2001 and 2013. Job losses occurred in every state, primarily in manufacturing. Offshored jobs have diminished American employment opportunities, helped contribute to wage erosion, had a dramatic and negative effect on the domestic economy, and negatively impacted the environment through higher carbon emissions and other pollution from some developing countries and from long distance transport.

The winning strategy is balancing the trade deficit with a strong investment in new technology and skills training and increased corporate use of total cost for sourcing and plant siting decisions.

By reducing our trade deficit, reshoring has the potential to increase US manufacturing by 25%, curtail unemployment and the budget deficit, improve income equality, strengthen our defense industry and motivate skilled workforce recruitment. Achieving this potential requires your help at your company and in your community!

In summary, Industry 4.0 solutions give manufacturers the tools to increase speed to market, and boost productivity and the competitiveness needed to support reshoring efforts.

The Reshoring Initiative provides a broad range of free resources to bring back more manufacturing, including:

- Total Cost of Ownership Estimator® — A free online tool to help OEMs evaluate sourcing alternatives and suppliers.
- Reshoring Library — Contains 3500+ linked articles on reshoring. See what your competitors are reshoring. Learn from them. See what companies in your customers' industries are reshoring. Sell to them.

- Case Studies — Submit your own reshoring case for free publicity and to make reshoring more visible. Receive a free “Manufacturing is Cool” T-shirt.
- Economic Development Program — Strengthen your region by replacing imports with local production, ideally yours. Have your local economic developers contact us.

(Sandy Montalbano D’Amico is Consultant to the Reshoring Initiative®)